# Presentation abstracts

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Infrastructure Problems and Solutions in the Global Suburb

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**The Three-Dimensional Dialectics of Suburban Infrastructure:**

**Scale, Centrality, and the Spatial Politics of Infrastructure in Chicago Southland**

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*Abstract*

On-going processes of deep sociospatial restructuring have led to the development of a diffuse patchwork of amorphous suburban constellations across today’s urban peripheries. The production, form, and function of networked infrastructures have been central to this urbanization process. Suburban infrastructures, Filion and Keil (2015, pp. 5-6) have suggested, are constructed by complex governance regimes, contested by diverse stakeholders, and are generative of distinct social norms. Their unpredictable and overdetermined nature problematizes how we engage the temporal and multiscalar experience of, and competing claims to, suburban space. As the rhythms of mobility underpinning variegated modes of suburbanism come into conflict with the circulation of capital, people, and goods operating at alternate scales, they reconfigure and are redefined by broader urbanization processes that may now be considers planetary in nature (Brenner, 2014). The extended and networked nature of infrastructure systems raises a central epistemological question as to whether there is there anything distinct about *suburban* infrastructure, or the social, technical, or political regimes that singularize the ‘suburban moment’ in their production, governance, or use? (Filion & Keil, 2015, pp. 10, 20).

What, then, does it mean to think of infrastructures as *in*, *of*, and *for* suburbs?

I begin from the proposition that the complex spatiality and temporality of suburban infrastructures is reflective of imbricated ways in which they are (1) physically located and embedded in suburban space; (2) produced and performed as outcomes of the sociospatial dynamics of suburbanization; and (3) generative of new modes of suburbanism and political practice. In order to grapple with this multi-dimensionality – and identify what might be distinct about suburban infrastructures themselves – this paper proposes a theoretical distinction between:

* Infrastructures of suburbanization as the social institutions and place-based material elements that give rise to the distinct morphologies of suburbs;
* Infrastructures of suburbanism that are appropriated are repurposed through suburban spatial practice and are constitutive of qualitatively distinct modes of suburbanism; and
* Suburban infrastructures that integrate and articulate suburban constellations within the multiscalar dynamics of contemporary global urbanization. Here, suburban infrastructures may be understood as socio-technical systems connecting and mediating abstract, yet essential social relations and the concrete spaces and practices of everyday life, with ‘the suburban’ functioning as an expression of *the-urban-as-level-of-analysis* (pace Lefebvre, 2003, pp. 79-81).

Examining the three-dimensional dialectics between these infrastructural moments elevates questions of scale and centrality in the study of suburban infrastructures and conceptually positions them as an essential element of the implosion/explosion dynamics of extended urbanization. Following Lefebvre (1996), the production and extension of new, multifaceted centralities within suburban landscapes (beyond those traditionally associated with the urban core) offers the potential to transform peripheral areas into *urban* spaces by extending the struggle against exclusions from space. In this context, it is vital to analyze how differing infrastructures condition concurrent social centralities at different scales and the potential repercussions for (sub)urban inhabitants’ spatial and political practices. I develop this argument, and concretize the proposed conceptual framework, through a case study of the spatial politics of infrastructure in Chicago Southland, focusing on attempts to redeploy the region’s extensive transportation infrastructure and underutilized industrial capacity to promote a localized model of sustainable economic development.

The Elgin, Joliet & Eastern (EJ&E) Railroad skirts the periphery of the Chicago city-region, but forms a central part of a continental-scale rail infrastructure. Its purchase by the Canadian National Railroad (CN) in 2009 exposed inherent tensions between the practices and imaginaries of Chicago as a regionalized global port – a central logistics node in international trade and capital flows – and a space of multiple, territorialized social identities and interests (see Keil & Addie, in review). Debates over the use and exchange value of the EJ&E line re-opened enduring tensions between Chicago and the collar counties, articulated via competing visions of global freight movement, local mobility, and the lived experience of suburban space. Acquiring the majority of the EJ&E Railroad not only allowed CN to bypass congested tracks in central Chicago but also connected their expansive Canadian network to American holdings that extend to the Gulf of Mexico. The Chicago region was consequently positioned at the center of a major transcontinental economic artery. Affluent north and western communities in the Chicago region expressed concerns surrounding noise and air pollution, delays at at-grade crossings caused by increased rail traffic, and the elevation of freight rail movement over regional commuter lines, while others contested the potential economic benefit the deal would have for the region (Cidell, 2012). The EJ&E purchase posed a more complex question for the south suburbs. The sale allowed CN to relocate their switching operations to Indiana and convert their Gateway Yard in south-suburban Harvey to an expanded intermodal facility. This presented an economic boon for low-income, economically depressed, and predominantly Black areas of Chicago Southland, but increased freight movement still posed significant disruption for local residents. Support for the CN takeover consequently divided along parochial lines.

The political implications of the purchase of this *suburban infrastructure* underscores the contradictory logics of regionalism as a territorial politics of collective provision (Jonas, Goetz, & Bhattacharjee, 2014) and a project of competitive territoriality (Brenner, 2004) – as well as the position of ‘the suburbs’ within both these spatial strategies. However, the particular assemblage of infrastructure facilities, existing (yet underutilized) industrial capacity, and the need for innovative, localized economic development in Chicago Southland has forged an emerging political consensus surrounding a post-suburban economic development agenda. A network of regional partners has formulated a redevelopment strategy aimed at reimagining Chicago’s industrial south suburbs as a modern sustainable manufacturing cluster for green infrastructure (Center for Neighborhood Technology, 2010). The Chicago Southland ‘Green TIME Zone’ revitalization strategy and constituent ‘Logistics Park Calumet’ initiative are premised on integrating transit and cargo-oriented development with green manufacturing. Their sustainability plans look to promote economic development by leveraging the social and spatial infrastructure in the Chicago Southland suburbs, but also seek to mobilize global capital to translate brownfield space into desirable housing, employment, and environmental options to support a nascent post-suburban accumulation regime.

By interrogating the distinct ways in which infrastructures are constructed and problems and potential solutions within this emergent suburban constellation, this paper seeks to illustrate how conceptual and empirical approaches can deepen our understanding of both suburban infrastructure and peripheral urbanization. Mobilizing the conceptual framework of *infrastructures of suburbanization*, *infrastructures of suburbanism*, and *suburban infrastructures* opens a means to assess how actors operating across multiple scales articulate and operationalize claims to “the right to suburbs” in practice. With this, suburban infrastructures can emerge as a crucial context and vital mechanism underpinning the emergence of a progressive polycentric suburban spatial polity, positioned between the overarching tensions of centrifugal and centripetal global urbanization.

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**Suburban Infrastructure and Transportation Choice**

The pattern of decentralization that occurred in North America following the second World War is well-documented. For a number of reasons, cities grew in both population and the physical space they occupied. The outward growth of activities required and, some argue was predicated upon convenient, ubiquitous travel over longer distances. In this period, the automobile was seen as the future of urban transportation; its unmatched convenience, affordability, and society’s linking of the car to status led to massive growth in auto ownership and use.

As suburban regions grew in population and subsequently employment, the level of transportation activity also increased (Hanson and Giuliano, 2004). The idea of suburban “activity centers” or “edge cities” – concentrations of activities outside of city centers – began to appear in the literature (Giuliano and Small, 1991; Garreau, 1991). Because these suburban regions were developed with a unique focus on auto transportation, accommodating increased demand became problematic. Transportation challenges that were once confined to urban areas – congestion, auto delays, or safety concerns – were becoming more common in suburban areas.

Planners and engineers reacted to these growing challenges. One approach was to expand the suburban infrastructure. Arterials were widened. Intersections were expanded to include more turning lanes. Even larger tracts of land were allocated to parking. In general, auto capacity was further expanded. The results were short term improvements in auto performance. From a utility theory perspective, these investments lowered the cost of auto travel in suburban regions; as a result, travelers were further motivated to choose automobiles for trips, which generated more trips from what is now recognized as “latent demand” (Orski, 1990).

The expansion of infrastructure also had other impacts. Larger arterials, with higher volumes and sometimes higher speeds, combined with wider intersections, further dissuaded travel by non-auto modes. Cycling became less viable; walking, which was already uncommon in suburban areas was nearly eliminated in some North American cities. Auto dependency grew and the (negative) cycle of trying to accommodate auto at the expense of other modes was propagated (Vuchic, 1999).

At various points between 1990 and 2010, cities planners and engineers began to ask if public transport (transit) could address at least in part suburban transportation problems. The answers were not always positive. Suburban development patterns posed many problems for transit providers. Lower densities produced too few trips per unit area, and attracted too few trips to destinations, to create heavy demand corridors on which transit could attract sufficient ridership to make routes economically viable. Even when densities were sufficiently high, transportation networks were circuitous and poorly connected, precluding ease of access for riders and directness of connection for routes. Perhaps most importantly, most transit providers attempted to serve suburban areas using technologies operating in mixed traffic. The concept of dedicating right of way to transit vehicles at the expense of auto traffic was not often considered and, when it was, the idea was usually politically impossible.

As a result, the performance of the transit system was guaranteed to be worse than autos in terms of travel time, reliability, comfort, etc. Few riders materialized. For the transit agencies, the cost recovery ratio – the amount of operating cost recovered through fares – was very poor and pressure grew to achieve improved “operating efficiencies” on these routes. Service frequencies were reduced to save operating costs, and transit became even less competitive.

Recognizing a need for improved public transport to compete in certain corridors, many cities turned their attention to “higher-order” transit connecting suburbs to urban cores. Calgary, Edmonton, and Vancouver invested in Light Rail Transit (LRT) systems that were separated (for at least parts of their alignments) from mixed traffic; similarly, Ottawa elected to build separated bus rapid transit. In the United States, about 10 cities have built LRT systems just in the last decade, most with some segregated operation.

The levels of success of these systems are mixed. In Calgary, the LRT ridership is very high by North American standards. Yet, overall, the system has had the curious impact that while employment in the city center has remained very strong, residential land use in suburban areas has actually become more decentralized. In essence, Calgary’s LRT has been a vehicle of outward growth, producing greater need for suburban infrastructure. Suburban transportation problems have not actually been addressed by the introduction of LRT. Congestion remains a challenge; areas around stations that had the potential to generate higher density, more transit-supportive activities, have largely become parking lots.

In Houston, Texas, a city without land use controls but a relatively strong concentration of downtown employment, an LRT investment also has reasonably high ridership numbers. The impacts of the LRT on suburban areas are best seen on the city’s multiple circumferential freeways (beltways), where a large number of park and ride facilities have been constructed. The contemporary commuting pattern for many is to travel by car to the P+R facility, board a high frequency, high comfort bus system operating in its own lane on the freeway, and connect to the LRT system for distribution in the urban core.

One common characteristic of recently-constructed LRT systems is that they tend to be radial – connecting suburbs to downtown. While this kind of alignment provides choice for these regional trips, still very little attention has been given to serving trips *within suburbs* *and between suburban areas* (Casello, 2007)*.* A major challenge for transportation planners and engineers addressing North American city patterns is how to introduce integrated public transport systems to serve these trips. In the planning literature, much is written about “nodes and corridor” strategies to connect activity centers in polycentric metropolitan areas. But the ability to “retrofit” these corridors with meaningful transit remains a major challenge. The same questions faced four decades ago – are communities willing to allocate dedicated resources (lanes and funding) to transit – are returning to the forefront today. Further, the willingness of land use planners to limit new development into targeted corridors, at the potential expense of increased local economic development, is also questionable.

The Regional Municipality of Waterloo, to my knowledge, is one of the only North American regions that is taking on this challenge. The Region’s policy and investment strategies are to dedicate LRT infrastructure along a central corridor, connecting multiple nodes in a low density area. The Region is also establishing land use controls and, to a lesser extent, economic incentives for development along the corridor, between the nodes created by the LRT stations. Finally, the Region is investing in upgraded bus service on six to eight low- to moderate-density corridors to further guide development and address the suburban transportation challenge.

In many ways, the Region’s multi-billion dollar investment is a test case for the rest of North America. If the Region is successful in preventing the development of suburban congestion, accommodating growth and controlling its fiscal health, the model used here can become a precedent for many Canadian cities – Hamilton, London, Winnipeg, and Victoria – that are considering how to manage suburban transportation challenges.

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**Landscapes of Infra-structure: Urban Transformation, Development, and Neoliberal Capitalism in India**

As the discussion paper by Filion and Keil (2015) rightly points out, infrastructures are central to the dynamics of extended urbanization and are in fact the ‘material form’ or the ‘substrate’ that make the urban possible in its myriad forms. In social theory, there has been a long and intense engagement with the concept of structure, from the structuralists to the post-structuralists the metaphor and materiality of structure has haunted us. And it is in the alleys of structure that the concept of infrastructure too has lurked around for quite a while, albeit in different guises. Whether it is the Marxian base and superstructure, or Bourdieu’s habitus and discourse, or Saussure’s *langue* and *parole*, structure and with it infrastructure have offered important analytical entry points to examine the embedded social and material relations of power and authority and identify the *context* (or ecology) of social relations and practices. In a sense then the idea of (infra)structure is not new, yet the profusion of interest in infrastructure and its ramifications is certainly new. It seems as if infrastructure is back with a vengeance, and particularly more so in the space of the urban. For instance, in India right now in much of electoral posturing and campaigns, infrastructure is the heart and center of the political rhetoric. In the most recent legislative elections in New Delhi in February 2015, it was the populist Aam Aadmi Party’s (Common Man Party) promise to bring water and electricity to the denizens of Delhi that led to the ouster of the incumbent Congress Party. While in the seventies and eighties in the context of developmentalist politics in the third world, it was the promise of “food, clothing, and shelter”, which Indira Gandhi, India’s former Prime Minister captured in her popular slogan of – “roti, kapada, aur makaan,” (food, clothes, and housing) that churned the political machinery, the politics of our times is centered around “roads, electricity, and water.”

The obvious question then is why now and for whom. According to Filion and Keil, the growing interest in infrastructure signals a crisis; a crisis of access (physical), of expertise and knowledge (technology), of resources (governance), a crisis that is intimately linked to the neoliberalization of capital and governance. In the global south, as infrastructures of mobility, information, and investment have emerged as key sites for opening up and promoting spaces of exchange, circulation, and movement, of both people and goods, they have also become key sites of contestations. With the widening gap of income and growing inequality between the haves and have-nots all over the world, infrastructures are the new frontiers where the battles of our century are being fought. Importantly, in an urbanizing world, it is safe to say that the politics of infrastructure too is urban and alerts us to the challenges of the urban transformation. In short, the recent interest in infrastructures indeed reflects a crisis that is deepening and is deeply political. It is political not only because infrastructures are built forms that are backed by powerful interests, investments, and capital but also importantly they are constitutive of the very grain of the urban. They redefine the contours of social *as well as* natural relations of everyday life quite robustly in this phase of capitalist urbanization.

Moreover, as sites of investment and improvement infrastructures work in another register – they are **governmental apparatuses** that configure the contours of vernacular modernity, conjure images of far and distance futures, cultivate aspirations, and contour the moral economies of desire, in this moment of world-class city making, especially in the global south. Ironically, even the farmers who lose their land for building a highway take pride in the expressways and articulate their desires for faster cars and bullet trains. From these points of view, infrastructures stand as extensive techno-social-political networks that allow *or* forbid the flow of goods, people, and idea. They as Brian Larkin in his incisive piece – “The Politics and Poetics of Infrastructure” points out are “the architecture of circulation, literally providing the undergirding of modern societies, and they generate the ambient environment of everyday life.” (2013:328). In considering roads, highways, and sewage, infrastructures that are propped up through competing registers of speculation, fantasy, dreaming, materiality, and control, we now turn to explore the stories of land, waste, property and value that may help us make sense of infrastructures of the peripheries in India and help us account for the changing boundaries of city and periphery, nature and society.

Infrastructure of the Peripheries: The case of Gurgaon

*Quick History of Gurgaon*:

Until a few decades back, Gurgaon was a cluster of villages inhabited by farmers and pastoralists from the Jat and Gujjar castes, along with Yadavs and Balmikis. Since it was arid and deemed to be ecologically unfit or handicapped for agricultural innovation and modernization it was largely overlooked by the planners of modern India. But, partly due to its proximity to the airport and highways and partly due to the politics of caste and land acquisition, Gurgaon in the words of a town planner witnessed “a meteoric rise.” Some key players like the land developer – DLF (Delhi Land and Finance) were central in this process and played an important role and acquired large swathes of land from the villagers and established several private gated housing colonies, IT complexes, and more.

Uneven Landscape of Development and Infrastructure

In the urban peripheries of India and more generally in the global south, instead of a single homogenous stretch of urban and urbanizing landscape we find it instructive to identify different urban typologies. In Gurgaon four urban typologies can be identified today. Each urban form has its own or sometimes overlapping locus of authority that constitutes the landscape of infrastructure. It is through an elaboration of these diverse infrastructural arrangements I make an attempt to make sense of how places like Gurgaon work.

1. ***The Urban Village***: In Gurgaon there are close to 50 villages that are bound literally by a Red Tape, or *Lal Dora*, within which land cannot be bought or sold. Very recently, these villages were brought under the municipal jurisdiction from Panchayat system (Village council). These villages now fall under the Gurgaon Municipal Corporation. Interestingly, in many cases the new municipal boundaries drawn in 1996 do not overlap with the village boundaries, generating tensions, conflict, and court cases. But such grey areas have opened up room for contingencies and manipulations, which the local villagers and outsiders have seized. In addition, as the new municipal governance takes form, there persist many wrinkles that need to be ironed. There are elected councilors from the villages as well as from the gated private colonies, who often have radically different vision of the city. While some villages struck deals with land developers to give them access to infrastructure services, most villages until recently did not have access to the main road and most don’t have sewerage.
2. ***The Un-Regularized Areas***: (The grey zones) - A number of industrial workers, migrants in Gurgaon town, and village families have invested and built housing outside the Red Tape areas or in areas that fall within 100 meters of the army base. The municipality does not provide any infrastructure to these areas as they are un-regularzied colonies. The infrastructure here is primarily laid out through informal arrangements between the local leader and municipality workers and/ or informal waste collectors.
3. ***The Haryana Urban Development Authority (HUDA) Colonies:*** The state colonizer, which bought off land from farmers under the Land Acquisition Act of 1894 and has been developing them based on different housing typologies. The infrastructures in these areas are managed by HUDA. The infrastructure in this part is managed through maintenance charges and overall city infrastructure is funded by one time External Development Charges (EDC) as well as property tax.
4. ***The Private/Gated Colonies***: The private colonizers such as DLF also bought and assembled land from farmers to put private colonies together. For maintenance of infrastructure within these colonies the private colonizer charge a maintenance charge as well as one time EDC for city-wide infrastructure. Only recently, the private colonies have been brought under the municipal property tax system. The infrastructure maintenance is largely contracted out to local contractors from Haryana, particularly Jats. But the boundaries between private colonies, urban villages and HUDA are stark and so are the arrangements of infrastructure.

In this fragmented and charged landscape of uneven urbanization, it is hard to make categorical distinction between urban and suburban infrastructure as elements of each bleed into the other and take similar forms, yet it may be productive to identify some differences. In the global south, in the suburbs there is a new and complex array of new actors who have emerged as critical brokers and mediators and they make the infrastructure work (or not). They have unprecedented capital, power and agency and it may be worth exploring and reflecting on their role. Secondly, the key issue in places like India, and even China, is to attend to the **infrastructure of infrastructure,** that is, land. With none to poor land titles and records, it is the politics of land that is surfacing in the sphere of urban infrastructure, as developers or the government is forcibly acquiring land and making little compensation. The recent and growing numbers of conflicts over highways and roads are *all* related to forced land acquisition and poor compensation. The conflict over infrastructural land is a distinctively suburban feature as questions of land and property are more or less settled in the context of the city and have a suburban flavour as often it is agrarian land that is being urbanized through infrastructure.

II. How to make sense of infrastructure? How to understand the politics of infrastructure?

Some of the most interesting work on infrastructure is informed by the confluence of anthropology, geography, and science and technology studies (STS) (Appel 2012, Anand 2011, Bear 2007, Elyachar 2011, Gandy 2008, Hull 2012, Larkin 2013) and has troubled the long held binaries of nature and society, social and material. Here, from a Latourian focus on networks and actors, this body of writing has attended to the vitality of matter and taken the materiality of the form, that is the ecology of infrastructure, seriously. If we want to capture the multi-scalar and multi-local reaches of infrastructures and examine their different aspects, then such a political ecological and materialist approach will be most productive.

III. How do infrastructure work?

In the case of Gurgaon and most suburban spaces of India and South Asia more broadly, even though infrastructure are planned there seems to be a flexibility and informality that is built into the planning of the city. Since there are multiple arrangements of infra-structures that correspond to different urban forms, there are also a range of actors - civil society groups, environmental groups, residents associations, State Development authorities, City municipalities, Private Developers, Old and new politicians, contractors, residents and migrants – who work towards disconnecting, reconnecting, bypassing, displacing and relocating different parts of the waste infrastructure through deals, negotiations, philanthropy, personal networks and/or political pressures, so as to shape the city for oneself. This process is one of acting on the city-infrastructure and through it onto others. Thus as the discussion paper highlights, infrastructure is not just an end but also the medium to act on the city and shape it. This techno-politics (Mitchell and Joyce) of making infrastructure work for oneself is central to making sense of infrastructure.

IV. How do we study infrastructure, what is the sense and knowledge of infrastructure? (Methodology)

The discussion paper considers two kinds of knowledges: technical, which is the domain of the experts who plan these infrastructures, which always seem to be in a stasis and *apriori*; and second, the provisional knowledge of the informal kind, based on experience and informal apprenticeship. But in the context of emerging cities like Gurgaon, where land ownership and governance systems (both of which are related to each other) are fragmented between multiple actors and agencies. Here knowledge-making is always in process, in movement, and gets shaped in simultaneity with the ways in which actors act on infrastructure. Often times, due to stark boundaries between different ownerships, infrastructures end up going nowhere, which then get reconnected through informal measures between the state and the private developers. Here, it may be interesting to bring a more ethnographic sensibility and focus on the everyday practices and map the different actors and agents who play an important role in making the infrastructure work – so who dumps, who smells, who complains, and who mobilizes, and who responds – may be a potential line of inquiry that reveals the mechanics of the urban and its lifestyle.

Second, from an STS perspective and from earlier anthropological focus on the “social life of things” (Appadurai), it may be productive to follow “things” as they move through different parts of the city. If infrastructure is about mobility, and infrastructure is always in the process of becoming, then the things that are carried, the people who work on it and shape it, are also always in movement through different spatial and temporal realms. Thus it may be analytically useful to look at how things move through these infrastructural conduits, how they get acted upon, how they act back, in different spaces and how different histories and ecologies play a role in it (past and present).

Third, infrastructure of work: while we can trace what infrastructures do, it is critical that we also turn our attention to those who make it work, that is pay attention to the lived realities of the infrastructure, attend to people as infrastructure too and in the case Gurgaon take account of the construction workers who make infrastructure and the urban possible.

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**Switching Tracks: Towards equity in public transit infrastructure priorities in the Greater Toronto and Hamilton Area**

By Sean Hertel and Michael Collens

We propose that equity, being the fair and appropriate distribution of costs and benefits, should be specifically identified as a core determinant and goal of public transit infrastructure investment decisions in the Greater Toronto and Hamilton Area (GTHA). In doing so, we reflect on processes influencing the existing, planned and under-construction network of public transit in the GTHA through the lens of social justice and municipal governance literatures in combination with a scan of international public transit case studies.

While the GTHA is a large, fast-growing and generally prosperous region we make the claim that the benefits of public transit investments are not equally distributed and are problematic. Not unlike large metropolitan regions in around the world, the GTHA has structural inequities created over decades, if not more than a century, of decisions being made and not made: where growth occurs; the type and density of development; where transit and other infrastructures are constructed, and; where public and private capital is invested and extracted. While the region, as a whole, stands to benefit from public transit infrastructure investments, those benefits are unequally distributed within the region.

Further frustrating the equitable distribution of transit benefits across the region is that population and employment growth remains strong in the GTHA suburbs, while transit infrastructure and services there are not keeping pace in comparison to improvements within the city of Toronto. The GTHA suburbs are also becoming an increasingly polarized sociospatial landscape, which brings more urgency to the need for addressing and correcting growth-mobility infrastructure imbalances.

The planning, funding, and building of regional transit in the GTHA is perhaps as complex and layered and the region itself; through the interplay of Provincial and municipal transit systems, corresponding political structures, real and imagined centre-periphery and urban-suburban schisms, and different (often with divergent interests) constituencies or publics. Overlaying the more locally-scaled municipal systems, regional transit in the GTAH is led by the Province of Ontario’s transit agency Metrolinx, and directed by the 25-year, $50-billion plan The Big Move (Greater Toronto Transportation Authority, 2008).

With 1,200 km of rapid transit planned under the Big Move, in combination with the addition of 2.5 million people and 1.5 million jobs (Ontario Ministry of Finance, 2014) to the region by 2031, this period is the single greatest – and perhaps last – opportunity to complete the regional transit network required for the GTHA, and to do so in an equitable manner. It is an opportunity to counteract the structural inequities that have been created by, and have persisted throughout, past growth-infrastructure cycles and “the inertia of the public transit system” (Mettke, 2014, in Filion and Keil, 2015). This includes the deliberate re-calibrating of public investment decision-making criteria to align with social need, and to re-balance obvious gaps in investment between the centre and periphery (Silk, 2011).

The literature indicates sociospatial inequality is increasing in the GTHA (Hulchanski, 2010). If we are to make headway at reversing it then we need to begin with defining what equity is, and how it can be measured. Transit investments, by their very nature, have consequences beyond capital (rolling stock, terminals) and the operations (routes, headways) they support. They also build cities, enable communities, and empower individuals to participate in society’s opportunities more fully. Correspondingly, we refer to “transit equity” – also called “transit justice” about which there is a large literature, and “fairness” – as the fair distribution of the benefits and costs in a manner that is responsive to the social and economic needs of the most number of residents, and especially those most vulnerable.

We begin with exploring the fact that there are winners and losers. Deciding transit infrastructure priorities – lines, technologies, station locations, service frequencies, budgets – preordains those who stand to win and lose from those decisions. Our international review of jurisdictions and literatures points to historical and politically-reinforced transit path dependencies in Toronto and other major metropolitan centres: investments in lines and stations – almost always rail – tend to favour the influential power elites of the region, and thereby reinforce pre-existing socio-spatial inequities. In short, transit investments have tended to benefit areas that are already doing well, while not changing the prospects for areas that are not.

There are multi-scalar processes that manifest spatially in the suburbs that are essential to the metabolism of the urban region, and to connect the region to global circuits. However, these processes serve to fragment and segregate suburban areas both from each other and the central core. Importantly, the fragmentation is happening in governance as well, with the rise of the private sector and the retreat of senior governments. Social inequity has a physical form that can be identified geographically. Taking a nuanced view of suburbs, such as considering the “inbetween” spaces bypassed by prime circuit flows, helps to dispel the North American stereotype of a monolithic, middle-class landscape (Bourne, 1996).

Further compounding the win-lose nature of transit investments is gentrification, which redirects economic and social benefits of transit infrastructure back in favour of those with the means to locate near the best services. Most often, white and more affluent residents are the beneficiaries. This stratification of transit benefits further marginalizes disadvantaged groups, who are most often non-white, and, as our research shows, increasingly “women of colour.” More broadly, transit inequity is correlated with, and compounded by: class; location (centre versus suburb); ethnicity and racialization; age, and (dis)ability.

How do we shift from “picking winners” to creating equity? Interventions, whether top-down or bottom-up or combinations thereof, are required to more equitably distribute the public benefits of public transit investments – including, but not limited to, improved access to employment opportunities and services. Our review reveals that both government- (e.g. Bogotá, TransMilenio) and citizen-led interventions (e.g. Los Angeles, Bus Riders Union) have begun to bring about some degree of transit equity, or at the very least laid claims to it in an emerging public debate around it.

Strategies to address the “equity issue” are generally focused on the network (where the lines go), access (service), and price (affordability). Tools or levers deployed through various strategies include either, or a combination of, legal action, political action, state intervention, technical innovation, and economic incentives. These can give rise to a number of tactics including, for example, reduced or fare-free structures, the democratization of line and service planning, and the mandated consideration of social equity as a factor in determining new or expanded services. So often in the GTHA context transit infrastructure public debates are dominated by weighing technology options, and we tend not to consider such infrastructure as a service for the betterment of socioeconomic conditions. As Filion and Keil (2015) argue, “infrastructures are, therefore, not an end in themselves. They are enablers, providing conditions making other activities possible.” A transit equity lens is helpful to ensure that systematic inequities are not propagated and reinforced and to address social marginalization of disadvantaged groups and geographies.

We close by thinking about and taking action towards equity and transit justice. We need to begin to identify ways of thinking about transit justice and to ask important, and sometimes uncomfortable, questions that will help shape the conversation among community leaders and activists, government and governance actors, and academics.

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**Ince, Rebecca and Marvin, Simon, University of Durham**

Extended abstract – Suburban Infrastructures Workshop June 14-16th, Waterloo University

**Retrofitting ‘obsolete’ suburbs – networks, fixes and fluidity.**

**Rebecca Ince and Simon Marvin**

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Existing suburbs were frequently constructed under a modernist infrastructural logic that accelerated the development and roll-out of high energy consuming suburban landscapes. Yet under contemporary conditions of urban carbon regulation (While et al 2010), resilience (Davoudi 2012) and resource security (Hodson and Marvin 2010) new priorities for systemically reconfiguring suburban energy use have emerged as strategic urban priorities. Reshaping both the social and material organisation of the suburbs to meet these new energy related priorities involves developing a new retrofitting capacity and capability to systemically reconfigure existing energy systems and practices (Hodson and Marvin, *forthcoming*). Consequently, this paper draws on empirical work in the suburban context of Haringey, London, to investigate the dynamic, chaotic, highly contested process of creating a new networked infrastructure for domestic retrofit. It will explore both the divisive and uneven effects of its manifestation, as well as promising areas of challenge to the dominance of neoliberal urban governance.

The London Borough of Haringey, responding to pressure from local environmental lobbyists and to changes in national government policy priorities and funding, has purposively engaged in the creation of a networked service infrastructure for domestic retrofit services to households for the purposes of reducing their energy efficiency. This infrastructure is an assemblage of elements: *processes* such as outreach and marketing to householders, household surveys and assessments, accreditation of retrofit professionals and the installation itself, *actors* such as community groups, surveyors and design professionals, suppliers and installers, local authorities, central government departments, and *products* such as internal and external wall insulation, boilers, underfloor heating, and windows. The construction of this infrastructure involves a negotiation of multiple interests and factors. These include rules and stipulations from central government, place-specific issues such as socio-economic inequality, unemployment and local economic development, the climate-focussed priorities of the local environmental network and the hopes, capacities and skills of the local authority, its neighbouring authorities and the professional organisations involved. This heavily contested process has produced a variety of responses including a low carbon neighbourhood ‘zone’ based on energy efficiency and retrofit advice, a retrofit co-operative network of local businesses and community organisations, an EU funded business support scheme and a coalition between Haringey and five neighbouring North London boroughs in delivering a short-term national government grant scheme subsidising particular retrofit measures (largely solid wall insulation and boilers). Many of the processes, actors and products overlap in a shared network between the responses, but the ideologies, interests and power often do not. A critical investigation into this emerging infrastructure and its effects contributes to the debate around suburban infrastructures in five key ways.

Firstly, it explores and challenges distinctions between ‘soft’ and ‘hard’ infrastructures, by illuminating this peculiar,‘soft-ish’, service oriented (Mommas, 2004) infrastructure: a strongly relational, networked assemblage of actors, products, processes and different forms of knowledge (Star, 1999, McFarlane, 2011), which ultimately delivers a ‘hard’ *effect* on the built environment through altering the appearance and energy performance of housing, highlighting the complexity and grey areas between the ‘soft’ and ‘hard’ distinction.

Secondly, it explores drivers for infrastructural change. In this case, broad societal trends and pressures such as comfort expectations and international commitments to carbon reduction targets have rendered – in the view of policymakers - particular housing types and their energy performance *obsolete,* creating a strong and urgent national agenda around retrofit. This is not because the housing itself has degraded and its performance worsened - many homes have been standing for over a century and will still stand in 2050 (Ravetz, 2008) - but because the standards against which we are assessing its performance have changed in the context of these new pressures. Sims (2012) would term this mismatch between expectations or standards, and the physical performance of the building stock ‘slippage’.

Thirdly, the process of creating a domestic retrofit infrastructure in this suburban place illuminates key contemporary trends of urban governance relating to pervasive neoliberalism, austerity governance (Peck, 2012 and 2013), and the positioning and manipulation of suburban spaces in this climate as sites of experimentation especially in the governance of climate-related issues (Evans, 2011, Bulkeley and Castan Broto, 2013 and Karvonen and von Heur, 2014). National retrofit policy is defined by a narrow technological specificity for solid wall insulation as a presumed ‘fix’ for obsolete housing, as well as a focus on local public-private coalitions ‘kick-starting the market’. Yet the rhetoric of local experimentation sits uncomfortably alongside technical, legal, budgetary and professional constraints which have steered Haringey Council into partnerships with large commercial and third sector organisations rather than smaller, local co-operatives and community groups, reinforcing existing political and economic power inequalities and exposing the role of the state in encouraging private authoritarian governance (Ekers, Hamel and Keil, 2012). Patterns of sporadic funding opportunities with short-term timescales and tough targets have encouraged both competition and coalitions between spaces and places, creating ‘pop-up’ retrofit territories quickly forged for temporary purposes, as well as ‘hotspots’ at neighbourhood level which attract repeated rounds of funding, thus creating geographically uneven development and progress and huge diversity in outcomes, highlighting the ‘relational energy urbanism’ and geographically diverse nature of the broader energy ‘transition’ observed by Rutherford and Coutard (2014) and Bridge et al (2013).

Fourthly, it demonstrates vividly how the politics of infrastructure creation can create divisions and exclusions (Graham and Marvin, 2001, McFarlane and Rutherford, 2008 and Torrance, 2009), not only between suburbs, or between suburbs and the core of cities, but in this case *within* the suburban space itself. The national grant scheme has dominated the local agenda and hindered the development of the retrofit co-operative, which is now one of many struggling local retrofit ‘providers’ in a dense network. Clear local priorities around retaining revenue in the borough are compromised, short project timescales prevent the training of local unemployed youth in time to benefit from employment in the emerging infrastructure, and sporadic grant funding and heavy administrative burdens of accreditation hampers smaller businesses’ ability to plan financially for the long-term and compete with larger organisations for work. The grant scheme is designed for those who can pay, with a requirement for at least a £2000 customer contribution to each installation, and funding for those who are unable to pay provided by separate schemes, despite the services and products required being the same. Because of the policy focus on solid wall insulation, the network convenes around solid-walled properties, in areas that do not require planning permission due to heritage constraints or particular architectural features, thus segregating the borough by both socio-economic status and technical criteria. The emerging infrastructure therefore excludes households who are in financial difficulty (which are concentrated in the East of the borough) and those who live in heritage areas, again compromising local priorities of tackling fuel poverty and inequality and producing unequal geographical access between households.

Finally, however, some elements of the emerging infrastructure do represent promising examples of local innovation which challenge the dominance of the national agenda. The decision to contract an independent ‘smart advisor’ to protect householders against financial and hygrothermal risks chimes with the values of local authority officers, as well as their decision (upon protest from local suppliers and community groups) to allow access to retrofit grants using installers and products outside of the main commercial provider. There is genuine willingness of local authority officers to learn from experiences and ‘mistakes’ and engage in a reflection, feedback and evaluation process independent of central government, along with local political will to reconnect retrofit to local priorities around fair, green and locally beneficial growth. This has created the space for producing a Haringey-specific charter of principles for future retrofit schemes which prioritises contracts for local suppliers and installers and includes them and local community groups throughout the borough in designing the service. Engaging with academic research and identifying strong local capacities has enabled the beginnings of a community scale experiment which dovetails training for unemployed youth with the emerging supply chain in the local area and makes better use of the co-operative in addressing energy vulnerability. Networking events aimed at educating tenants and landlords about their legal rights and requirements, then linking them with the local supply chain, show how this exclusive, inequitable infrastructure can potentially be reshaped and linked to more socially just outcomes.

These tales of retrofit in Haringey tell us a complex story about suburbs and their developing infrastructures as sites and systems in painful tension between being controlled and manipulated by divisive neoliberal agendas through national policy, and being the roots of careful, considered local responses to a suite of issues that could demonstrate a more equitable alternative.

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**Logan, Steven, York University**

**Transportation as Transformation: A Media Analysis of Infrastructure**

This paper takes as its starting point Pierre Filion's (2013) claim that infrastructure can be understood as media, albeit an unconventional one. Filion draws on the work of Marshall McLuhan (1964), who claimed that the message of any medium is the “change of scale or pace or pattern” it introduces into everyday life (24). This allowed McLuhan to expand his definition of media to include electric light, cars, and roads. Approaching transport infrastructure as media means examining it as part of a relational field of interactions with other technologies that creates a new environment for mobility. Filion argues that although transport infrastructure is ostensibly about transporting people quickly and efficiently from one point to the next, the *message* of transport infrastructure is rather the environment that is created, an environment that is suburban. As Filion argues, “the suburb is infrastructure.”

This paper seeks to build on and expand this understanding of infrastructure as media, with the aim of thinking about infrastructure in new and productive ways. This paper does not limit itself only to McLuhan's thought, but draws on recent work in media studies that brings the non-symbolic, material aspects of communication to the forefront of analyses. A media analysis of infrastructure draws attention to the qualitatively different experiences of space and time that arise with the new environment. Here, the scale, pace and pattern of technologies of transportation and their infrastructure—walking, cycling, public transport, automobiles—constitute the character of suburbanisms. The paper will focus on specifically on the effects of infrastructure in the terms set out in the discussion paper: inequality and social norms.

In discussing media theory, I first look at how an analysis of infrastructure as media shifts the scale of the analysis. Instead of examining the content of media or the way individual people use technologies, media analyses of transportation and infrastructure look to the spatial and temporal environment that is created with the new technology. This rightly shifts the debate and the blame for sprawl, congestion, and other suburban problems away from the single objects—a car or a single-family suburban house—to the system and its infrastructure, which produces the need for these objects, which in turn perpetuate the need for the infrastructure.

McLuhan set out his media theory in direct opposition to the dominant theories of communication: the transmission or transportation model of communication. McLuhan offered a theory of communication that was about transformation not transportation. The latter is concerned with getting information, goods, people from one point to the next as efficiently as possible with minimal disturbance, while a transformation theory of communication is about how people are transformed in by the media they use. For the purposes of this paper, I build on McLuhan's idea of transformation by suggesting it applies to the built environment as well. Media transform people and the built environment.

But that does not at all happen evenly, an aspect McLuhan did not address; people experience what McLuhan called “speed-up” in different ways. In this next section of the paper, I want to turn to work that highlights the uneven ways in which the changes in scale, pace and pattern are experienced. This of course has important implications when considering the differences between transport infrastructure of the downtown or the Central Business Districts and the outlying areas, particularly when thinking about non-motorized forms of traffic like walking and cycling.

I want to further extend the reach of media theory and the different ways space and time are experienced by drawing links to Bruno Latour's work, who also used the concepts of transportation and transformation to sketch the multiple spaces and times that are produced in any given system (Latour 1997; Schabacher 2013). Like McLuhan, Latour points to two distinct experiences of space and time: *transportation* as the efficient and smooth travel through space, and; *transformation* as the consideration of the multiple entities, both human and non-human, that allow for transportation to happen at all.

With this theoretical sketch in mind, I will then turn specifically to some of the substantive issues in the discussion paper, and particularly the question of the effects of infrastructure on inequality and social norms, and how a consideration of these effects might influence the future trajectory of suburban infrastructures. In this part of the paper, I look at the relation between suburbanisms, and the infrastructure of automobiles and public transportation on the one hand, and walking, cycling and other self-powered forms mobility on the other. I draw on Ivan Illich's groundbreaking essay, *Energy & Equity* (1974), in which he argues argues that there are built-in inequities in the transportation system, which smothers people's ability to walk or cycle as part of their everyday activities, and promotes high-energy consumption for an elite few, and calls for huge public expenditures and increased social control. Following from the theoretical work on infrastructure as media, I want to turn to the bicycle, not as a sustainable version of automobility, nor a pedal-powered autonomous vehicle, but to think about the bicycle as media, as part of an infrastructure environment that does not simply alter the pace, scale and pattern of everyday suburbanisms, but that has the potential to do so in a socially equitable way. It also opens up a potential fruitful discussion and point of convergence between the infrastructure-heavy Global North and the “people as infrastructure” idea more prominent in the Global South.

Finally, in turning to a future trajectory of suburban infrastructure that does not privilege the car, I want to briefly discuss the question of the autonomous vehicle, raised by Pierre and Roger in their discussion paper, as having the potential to “revolutionize transportation in the suburbs.” I want to suggest that without considering the autonomous vehicle as an environment or media, it becomes a technological fix dictated by corporate interests (Google, Siemens, etc.), which does not take into account the way different social groups are marginalized by so-called revolutions in transportation and communication. As Sharma (2011) argues, the message of any medium is not simply how it changes urban space and time, but also the “temporal infrastructure” that accounts for the multiple ways in which these changes to space and time are experienced unevenly.

It is hoped that this paper's approach to infrastructure as unconventional media will help us to better understand and respond to possible future infrastructure configurations.

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**Macdonald, Sara, York University**

**'Greenfrastructure': The Ontario Greenbelt as urban boundary?**

**Global Suburban Infrastructure Workshop**

**June 14-16, 2015 University of Waterloo**

**Sara Macdonald**

**(The City Institute at York University)**

In this paper, I will be exploring the idea of how the Greater Golden Horseshoe (GGH) greenbelt can act as green infrastructure. As counterpart to the province's 'Places to Grow' legislation, the greenbelt provides important ecosystem services and functions both as an infrastructural conduit for major crosscutting mobility infrastructures and as a buffer between the city and leapfrogging suburbanizing settlements beyond. This paper will conclude by discussing the role that green infrastructure plays in the remaking of boundaries between the suburban fringe and the surrounding non-urban areas.

1. Green Infrastructure

The concept of green infrastructure has gained popularity in the past few years and has emerged as an important concept in both planning theory and practice. However, finding a single, common and agreed upon definition of green infrastructure in the literature is challenging. Hannah Wright has stated that green infrastructure is a concept that is ambiguous, evolving, contested and is difficult to define as different groups attach different environmental, social and economic meanings to it (Wright, 2010, 1004). However, she argues that there are three interrelated ideas at the core of most definitions: connectivity, multifunctionality and "green" (Wright, 2010, 1007).

In the past few years, green infrastructure has emerged as a new planning policy in the United Kingdom which has attracted attention due to an increased interest in “regional strategy production, as conditions have been favourable for the insertion of a new storyline about urban fringe green space governance [in] the national spatial discourse” (Thomas and Littlewood, 2010, 204). Within this context, “the concept of green infrastructure has emerged as a new way of looking at the urban fringe in the UK” and is considered to be a possible solution to spatial planning policies and is seen as an opportunity to deliver a range of environmental, social and economic benefits (Thomas & Littlewood, 2010, 209). Amati and Taylor have argued that the GGH greenbelt "is multifunctional and acts as green infrastructure to provide a sustainable context for future growth in the region." (Amati and Taylor, 2010, 147), and this argument will be discussed in the paper, after an overview of the GGH greenbelt is detailed.

2. The Greater Golden Horseshoe Greenbelt

The Greater Golden Horseshoe greenbelt is a permanently protected countryside of 1.8 million acres that stretches 325 km from the Niagara Peninsula at the American border to Northumberland County north of Lake Ontario. In February 2005, the *Greenbelt Act* was passed by Ontario's provincial government and this legislation allowed for the creation of a Greenbelt Plan, which was also released that year. The greenbelt was designed to protect against the loss of farmland, natural heritage, and water resource systems and to support the economic and cultural activities associated with rural communities (Ministry of Municipal Affairs and Housing, 2005). The Greenbelt Plan generally prohibits the designation of protected areas for development purposes, prevents development close to environmentally sensitive areas and promotes the creation of recreational spaces.

3. How can the Greater Golden Horseshoe Greenbelt act as green infrastructure?

The main method by which the GGH greenbelt can act as green infrastructure is through its delivery of eco-system services. Green infrastructure can be seen as a tool to deliver eco-system services in planning policy, and this concept of ‘eco-system services’ has become popular because of its emphasis on the human benefits of ecological functions (Wright, 2010, 1010).

The David Suzuki Foundation has defined “eco-system goods and services [as] the benefits derived from eco-systems. These benefits are dependent on the ecosystem functions, which are the processes (physical, chemical and biological) or attributes that maintain eco-systems and the species that live within them” (Wilson, 2008, 10). The wetlands, forests and agricultural land found within the greenbelt provide significant ecosystem services (such as carbon and water storage, flood control, erosion control, waste treatment, water filtration and pollination) and that this natural capital can be valued at $2.6 billion per year (Wilson, 2008, 1). As a result of these eco-system services, greenbelts can be seen as 'untapped potential’ that could become increasingly important for urban and suburban areas in the future, in particular in the face of uncertain global changes. As the role of greenbelts has evolved (and will continue to evolve) over time, this highlights the changing relationship between the city and nature, as both urban and suburban residents may become more dependent on the greenbelt's assets in the future.

4. Infrastructure within the Greater Golden Horseshoe Greenbelt

Filion and Keil discuss the importance of suburban infrastructure for the functioning of the entire region, in particular the urban core, and that necessary services are located in the urban periphery such as airports, golf courses, landfills and water treatment facilities (Filion and Keil, 2015, 3). In the case of the Greater Golden Horseshoe region, those noxious uses or networked spaces can sometimes be located within the greenbelt, so it is important to examine the implications of the location of those suburban infrastructures.

Within the Greater Golden Horseshoe context, the Greenbelt Plan does allow for the creation and expansion of major infrastructure projects within the greenbelt provided that it supports the rural activity found within the Greenbelt or supports the significant growth projected for Southern Ontario (Ministry of Municipal Affairs and Housing, 2005).

This paper will conclude by exploring what role does green infrastructure play in the remaking of boundaries between the suburban fringe and the surrounding non-urban areas (Keil and Filion, 2015, 21). Since greenbelts can act as green infrastructure, than a large scale planning policy such as a greenbelt could play a significant role in the remaking of suburban boundaries.

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**Moos, Markus, University of Waterloo**

**Sustainability as an urban way of living? Equity implications of planners’ interpretation of sustainable infrastructures**

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Even though sustainability is a loosely defined concept, it has been interpreted in very specific ways in the North American planning community. Urban planners have largely translated sustainability to mean increasing development densities and constraining urban growth to promote more active modes of transportation, such as walking, cycling and public transit. While there are other interpretations, for instance ecosystem planning, slow growth movements or local food systems, the “sustainability-as-density” or “smart growth” approach has arguably been the most prevalent.

Cities such as Vancouver or Portland are often celebrated in the planning community for their success in implementing the sustainability-as-density model. There is no doubt great value in pursuing an urban development agenda not based purely on automobility due to the environmental, public finance and health issues associated with an automobile based lifestyle. Nonetheless, the academic literature has been largely critical of the sustainability-as-density approach. This is because of its association with gentrification, tendencies toward environmental determinism, romanticizing of European urban forms and structures, and neglect of the social geographies of cities that shape housing and transportation patterns among other factors.

Following in the tradition of critical quantitative geographers, this paper examines how the implementation of sustainability in North American cities under neo-liberalism is creating new exclusion that keeps certain demographic groups from accessing mobility infrastructures. The gentrification literature has already documented the ways inner city redevelopment is contributing to the displacement of lower income earners and increases in housing costs near “sustainable infrastructures” such as transit stations, walkable neighbourhoods or cycling lanes.

However, less is know about the inherent demographic and lifestyle bias arising from the way sustainability is being implemented through the workings of the private sector real estate market. Condominium developments, either owner-occupied or investor-owned and then rented, have constituted the bulk of what is now often called “sustainable urbanism”. The high-rise housing form, the condominium tenure, and reduced public sector intervention, has blurred the lines between urban and suburban ways of living. This is because the increase of higher income earners in the center of cities has meant increases in home and in some cases even automobile ownership rates—these are qualities traditionally associated with suburban ways of living in North America.

Thus, the result of policies promoting “sustainable urbanism”, ironically, is that we have witnessed the emergence of suburban ways of living in inner cities, and the emergence of urban ways of living in suburbs, for instance due to the growth of lower-income, transit-dependent, largely immigrant households in the inner suburbs and “in-between cities”, but also the development of high-rise condos in suburban transit nodes.

The analysis of the changing social geography of two Canadian metropolitan areas, Vancouver and Montreal, shows “sustainable urbanism” as associated with a particular demography and lifestyle constituted by largely younger and childless households. Middle-aged households, particularly those with children and larger immigrant families, are increasingly denied access to “sustainable infrastructures” due to the lack of family-sized housing in walkable, cycling- and transit-friendly neighbourhoods. The exclusion effect is more pronounced in Vancouver than in Montreal, the former seen as the poster child for “sustainable urbanism”.

The planning solution to environmental concerns has been the promotion of an urban way of living, in terms of housing size and form, which has translated into demographic transitions in high-density areas rather than actually decreasing the housing consumption and automobility of larger and higher income households. Larger households and those with children who cannot afford central city living are increasingly portrayed as making “unsustainable choices” by living suburban lives, when these outcomes are actually dictated by the neo-liberal approach to implementing “sustainability-as-density” through the private sector housing market.

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**Morphet, Janice, University College London**

*Rescaling the suburban: new directions in the relationship between governance and infrastructure*

*a response to*

*The contested and unpredictable nature of suburban infrastructures*

*Pierre Filion and Roger Keil*

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The suburban as subordinate is a dominant determinant in the discussion of the ‘The contested and unpredictable nature of suburban infrastructures’[[1]](#footnote-1). Accidental, unplanned and market impulses to create suburban space in the service of neo-liberal economic policies are identified as determining suburban form. Detached, de-politicised dependencies, created by contested geographies and administrative boundaries of selected separation, have defined suburbanism in the era of economic liberalisation.

Yet new tropes of integration and multi-level governance[[2]](#footnote-2) are serving to redefine city-suburban relationships with a particular emphasis on the role of functional economic areas (FEAs)[[3]](#footnote-3). Shifting suburbanism suggests a fundamental re-conceptualisation of the power relationships with city dominance dependent on suburban success not serendipity[[4]](#footnote-4). The underlying reconceptualisation of this relationship can be explored through the concepts of subsidiarity, security, sustainability and society and they are refocusing attention on infrastructure away from sectors to scales.

The reformation of the understanding and governance of FEAs is a dominant economic ideology emerging from the OECD[[5]](#footnote-5) and being performed through its members including the EU, US and Australia. In this, the state’s success becomes reliant on the cumulative contributions of FEAs to GDP. This has been fuelled by Krugman’s theories[[6]](#footnote-6) on the value of internal as well as external trade. The rise of city growth using non-Western governance models in non-OECD countries is outpacing its members and is regarded as a threat[[7]](#footnote-7). If state economic success is dependent on trade both within and between cities, then the focus on removing institutional barriers that dominated world trade have transferred to concerns for internal fragmentation and costs of non-cooperation.

The success of the EU Single Market depends not only on removing barriers between states but also within FEAs. Similarly, the OECD has identified 784 different transport institutions operating in the Chicago FEA[[8]](#footnote-8). FEAS are being nudged to review their administrative boundaries away from bounded individualism to economic inclusion, celebrating internal interdependencies. Cities without integrated, equal and formal governance relationships with their suburbs are at risk of social, economic and environmental underperformance. Yet FEAs want the power to form their own relationships, focus on what is important and move away from state dominance. Subsidiarity offers the potential benefits of smaller independent territories or nations within the state[[9]](#footnote-9).

Why do suburbs want to enter these new relationships with cities? Defined by difference and their attraction in separation, suburbs are facing their own challenges. Changing societal values of sustainability and economic equality in the home are driving a shift from the suburbs to more densified cities. City flight is now to rural areas leaving suburbs as ageing and less-engaged communities characterised by short-term rentals by those frozen out by increasing city land values. Cites recognize that their scale and growth into powerful FEAS will depend on their ability to access a skilled workforce that can access workplaces through sustainable means[[10]](#footnote-10). Whilst separation from city neighbours defines suburbs, they are also dissimilar to their rural neighbours. Suburbs concerned by reverse flight and ‘peak car’[[11]](#footnote-11) want to engage to perform their role in ways that are now recognised and valued. This means change for the suburbs. Reshaping, densification and TOC around defined hubs gives a new sense of purpose[[12]](#footnote-12).

The recognition of the role of suburbs in the creation of FEA success, welcoming them into economic and administrative governance has changed power relations. In the UK these changes have been witnessed around major cities including Manchester, Leeds, Sheffield, Southampton, Glasgow, Edinburgh and Cardiff where political differences have been overcome in new alliances. These new governance formations have also started to recognise their power in larger groupings or ‘powerhouses’ that are redefining the role of the state with the local.

But why should the state welcome more powerful sub-state alliances? Re-sizing governance not only provides greater opportunity for economic success but is the only means through which sustainable adaptation is likely to be met. Carbon reduction is not only a concern to meet international protocols and agreements but is now central to energy security concerns that have arisen as a consequence of greater geo-political instability[[13]](#footnote-13). Individual behaviours cannot be coerced but have to be incentivised and acculturated within society. FEAs and their groupings, higher densities and public transport systems make a contribution to reduced consumption.

Energy security is also reversing state liberalisation policies[[14]](#footnote-14). Security is not an issue to be left to the market. Regulatory reform may mean less regulation but also a return to more centralised control. Sectors remain in internal silos of mode or method, isolated and inward looking relying on the arguments of competiton. These sectoral institutions are another set of barriers that are creating costs and inflexibility in achieving state economic, sustainability and security objectives. The dominant narratives of integration and multi level governance create policies with their focus on territory and place reducing the power of sectoral interests. If places matter more, infrastructure sectors and providers have a new set of criteria to meet politically and in the market-place. Dominant and more powerful FEAs, in larger groups, can assert the role of place as they take responsibility for territorial integration of sectoral separation.

The suburbs are in transition. They may never trade ‘edge’ for ‘edgy’ but without their inclusion within new governance spaces that equalise powers between the centre and the periphery, the futures of both are jeopardised. Suburbs have never been ‘outsiders’ or ‘other’ but semi-detached. Now recognition and equalisation of their role in the global future may be another, but less contested, step on an unpredictable journey from space to place.

**Peters, Frederick, York University**

Abstract for the Workshop, Infrastructure Problems and Solutions,

University of Waterloo, June 13-16, 2015

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“Experiments in Neoliberal Infrastructure: dynamic capitalist and institutional

learning in the neoliberal experiment of post-Soviet Europe.”

This paper discusses urban-suburban networks of water infrastructure in Eastern Europe in their hydromorphological and social-historical contexts to present an analysis of the governance situation of two cases in the eastern Baltic region. I focus on Gdansk, Poland and Tallinn, Estonia, comparing these two situations of public-private partnership to one another but also to their regional suburban neighbours’ situations, where the water companies remain in public hands; in all cases a “corporatization” of water management in Eastern Europe is also at issue. Introducing Matti Siemieticki’s sence of periodization of public-private partnerships into this region, it makes sense to think of the period of 2005 to 2015 as distinct from the initial period (1995-2005). My primary emphasis is on the official recognition and reaction to mistakes made in enacting public-private partnership, in governance and environment. Grounding the analysis in local specifics of place and personal agency in the political and corporate forces involved, I explore institutional learning in terms of neoliberal infrastructure, while making the argument that even “hard” infrastructure is a highly social entity, its forms determined through contestation. Moreover I make the case for further exploration of a materialist, political ecological account of such as social infrastructure, a term I use as expanded from its traditional definition as the “soft” sub-category of infrastructure.

Water infrastructure governance was dynamically restructured in the post-Soviet period in Eastern Europe, surprisingly quickly on a legal level in many of the countries that aimed to join the EU in 2004. This legal process plus the environmental regulations put in place with EU membership aspirations were coupled with financial implications for local municipal governments who now had control of their water infrastructure but not yet capacity to both govern and finance them. From central state controlled entities, water management organizations were devolved into municipally owned companies. These companies, now subject to significant investment requirements in order to meet regulations relating to environmental goals, became in certain cases, objects of interest for international financial organizations and multi-national corporations; in certain places, not in others. This era from around 1995 to 2005 in the region marks a significant moment of neoliberalism on the ascendancy in international financial institutions and governance bodies of the EU, the beginning in Eastern Europe of neoliberal infrastructure. Empirical study of the cases of Gdansk, Poland and Tallinn, Estonia, ground a discussion of what neoliberal infrastructure means, but also allows for grounding of a discussion of what I am calling social infrastructure.

While water infrastructure, pipes and treatment plants, pumping stations and the like have traditionally been understood in terms of technical discourses, the domain of experts with instrumental takes on defining adequacy of service provision, what the neoliberal turn in water infrastructure governance in the expanded EU highlights precisely the degree of social determination factors into categorically “hard” infrastructure. As much as the technical requirements for acceptable levels of organic and inorganic compounds that may be consumed as drinking water, or expelled as waste-water became a significant concern, restructuring the water services in both bigger new municipal units and smaller peripheral ones also became a highly political discourse, as in certain places, issues of monetization of water infrastructure assets and costs revealed issues of the uneven social distribution of significant value, and related questions of social equity and justice. Water infrastructure is largely buried or the plants and pumping stations hidden in the urban periphery, into the suburbs own edges – subterranean and suburban simultaneously – the technical orientation of water infrastructure discourse could not quite hide just how social is this category of “hard” infrastructure, as capitalism took a run on certain networked systems – Gdansk, Tallinn, but not others.

Tracing out what came to be known as neoliberalism historically in Europe with regard to infrastructure restructuring, this paper engages debates raised by Filion and Keil (Workshop Paper, 2015). The questions they raise, of contestation of asset and value distribution, the far-reaching internationalization of local infrastructure, and the unpredictability of the downstream outcomes of upstream decision making are explored through the recent (2005-2015) evolution of Gdansk and Tallinn’s varied takes on privatizing their water systems. Given the considerable impact basic water service provision has on the populations a networked system serves, the cost and value calculations made locally and on the level of EU granting bodies and international financial institutions, and the complexities of the ecological, hydromorphic realities of a place, there is a high level of inter-constituent conflict around water management. There is also evolution to be seen in the methods used to try to manage that conflict, in the relationships between private and public bodies, between populations and the water systems that serve them. Neoliberal restructuring has in many ways exposed the “black-box” of corporate water management, be it as a municipal entity or a market-driven public-private partnerships. Emphasizing the social through preference for the term “social infrastructure” this paper addresses how inequities and risk around water management modes continue to play out.

**Ren, Xuefei, Michigan State University**

April 12, 2015 University of Waterloo, Infrastructure Workshop

**Infrastructure and Mobility in Urban China: The Case of Beijing’s Metro Network**

I would like to use the case of Beijing’s ever expanding metro (subway) system to discuss some of the key components regarding the politics of suburban infrastructure laid out in the concept paper by Filion and Keil. Specifically, I will discuss the financing, constituencies, and ramifications of state-­‐led large-­‐scale public transit infrastructure projects in the Chinese context. My main argument is that in rapidly urbanizing China, infrastructure investment in mass public transit is often a deliberate tool for the state to capture rising land values and to promote property development on the urban periphery. A related observation is that in contexts such as China (and also India), where “suburban” does not exist—as a legal, administrative, and geographic entity distinguishable from “the city”, it is perhaps more useful to adopt the Lefebvrian framework of “extended urbanization” to think about infrastructural development on the urban edge.

First of all, I would like to point out the great variations of infrastructural networks in cities in the global South. In the concept paper, it makes frequent references to the deficiency and informality in the provision of infrastructure and services in the global South. There is a wide spectrum of infrastructural development in the global South and extra caution is needed when we attempt to generalize, such as on informality and deficiency. China is a premier example: it is a developing country with state-­‐of-­‐the-­‐art transportation infrastructure that is mostly “formally” provided by the local state; in other words, it is a typical case of state-­‐led authoritarian “splintering urbanism.” On the other end of the spectrum, there are Indian and many African cities, where public transit infrastructure on the urban periphery is almost non-­‐existent, and citizens have to rely on private (and often more expensive) services to get around. At the middle of the spectrum, there are some Latin American cities, which have over time developed a mixed portfolio of affordable, low-­‐tech public transit systems that serves residents living on the metropolitan edge, such as the much celebrated BRT (Bus Rapid Transit) system in Bogota.

In short, there is so much variation in the quality, quantity, technology, funding sources, and constituencies in the transport infrastructure sector in the so-­‐called “global south cities”, so that we should not over-­‐generalize in our comparisons with North America and West Europe.

In my paper, I will focus on the financing, constituencies, and outcomes/ramifications of Beijing’s metro network. Beijing added 235 miles of subway lines between 2007 and 2014,

a length greater than the entire subway system in the New York City. Today the city boasts a

total of 327 miles of subway lines, second only to Shanghai (340 miles) and far ahead of most global cities in the West, such as Paris, London, Tokyo etc. The break-­‐neck speed of subway construction in Beijing is very typical among Chinese cities—in fact, dozens of large cities in the country have made grand declarations to build their own subway networks, even though many of these cities can be better off with low-­‐cost solutions, such as light-­‐rails and BRTs. Subway has become a signifier of modernization and progress and it can give a major boost for local officials to demonstrate their achievements, and get promoted to higher-­‐ranking posts.

First, if one looks at the financing, metro financing in Chinese cities is solely provided by the local city governments and largely dependent on revenues from land leasing. As the municipal governments own urban land, they have been leasing out land to private investors to earn revenues—between 30% and 70% of municipal revenues come from land leasing across the country. Only since last year in 2014, the Beijing metro authority has

been allowed to issue bonds to raise funds. The dependency on land sales is unsustainable,

and without alternative funding, the rapid subway construction boom is likely to slow down in the coming years.

Second, there is a large power imbalance among the constituencies—the local government, the planners and technicians in charge of construction, and the larger public—civil society groups and residents. When it comes to subway construction, there has not been a case that residents whose dwellings happen to be on the proposed routes can negotiate with the local state apparatus to better protect their rights (to stay, in this case). This is especially apparent in Beijing, the national capital, where the city government is known for being intolerant when it comes to urban renewal and mega project construction.

Third, I will discuss the ramifications of the massive expansion of Beijing’s subway system, in regards to uneven development and mobility in the metropolitan region. The newly added 235 miles of subway in the last 7 years have completely changed the geography and mobility patterns in the capital region. For example, it has created new hubs, around major transit stops, and has led to hikes of property values along the new subway stops. But for

those areas that are “off the (metro) grid”, not connected by the new subway network, some of the places have become clearly marginalized because of the lack of accessibility. Thus, the case of Beijing metro is a classical example of “splintering urbanism,” and it has created new centers and margins.

In terms of mobility, with a daily ridership of more than 8 million passengers, there is no doubt that Beijing’s subway system has provided the much needed infrastructure to move people around in an urban region of close to 20 million. But the city’s congestion has not improved much with the extended subway lines. The crushing rush hour traffic, both under and above the ground, has become a permanent feature of the daily life in the capital. For the endemic congestion in the city, only part of the solution is in the provision of public transit, and the other part has to be sought in the housing sector. Beijing is a city with extreme forms of inequality in the housing sector. The skyrocketing housing prices have pushed the majority of the middle class and low-­‐income groups to the urban edge, but most of the jobs remain at the city center. The mismatch between employment and residence is one of the root causes of Beijing’s chronic congestion, which cannot be solved by simply adding more miles of subway lines.

Overall, it is ironic that Beijing has one of the most expensive and developed metro systems and yet it is one of the most congested cities in the world. Beijing’s metro is primarily a state instrument to promote property development on the periphery, rather than a policy

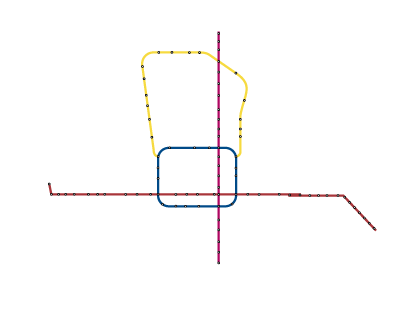
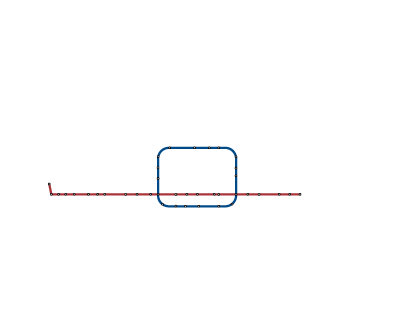
remedy to enhance mobility.

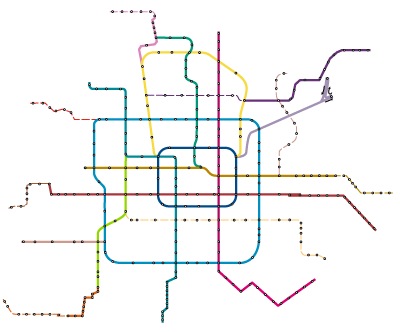
Xuefei Ren

Global Urban Studies, Michigan State University

Figure 1. Beijing’s subway map of 2001, 2007, 2015

2001



2007

**Rutherford, Jonathan, Université Paris Est**

**Beyond/before infrastructure: socio-technical disposition and planning for water and wastewater services in the Stockholm archipelago**

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Draft extended abstract for Global suburban infrastructures workshop, Waterloo (Canada), June 2015

The starting point for this paper is the observation that “the suburban infrastructural networks and grids are massively unknown and in need of better understanding and explanation. Suburban infrastructures suffer from the same simplification and stereotyping, the same neglect as the suburbs themselves” (Filion and Keil 2015, p.20). In this regard, we need to know more about suburban infrastructures, and we need to find a way of knowing and reading them which is distinct (but not so disconnected) from our reading of urban infrastructure for big dense cities, and which thus accounts for the socio-technical specificities of suburbs and suburban processes.

This is especially the case as in the peripheral areas of European cities that are not (yet) served by traditional centralized infrastructure, local officials are questioning the relevance of network extensions. In these contexts of low population density, actors and authorities are weighing up the options, between on the one hand the possible return on investment from network deployment, and on the other hand the technical difficulties and additional costs that would result from laying the necessary cables and pipelines. This is especially true for wastewater and energy (non-electric) systems, but also in some cases for water supply. These areas that lie beyond the network may be included in future extension plans or may be more dependent on alternative forms of service delivery, which in some cases may provide more satisfactory or relevant results. The production of suburban infrastructure configurations is, however, always a political process shaped by the interests, values and resources of particular actors.

This paper draws on some recent research conducted in peripheral municipalities of Stockholm County in Sweden on infrastructure forms, planning and politics in a context of shifting suburban demographics, lifestyles and techno-economic constraints. I start from a map of Stockholm County showing a large blue mass of centralized water and wastewater networked infrastructures in dense urban core areas surrounded by extremely fragmented patches of ‘other’ systems in much of the outer peripheral areas where access to networked water infrastructures is far less prevalent. What is infrastructure therefore in these outer areas? How do households access water and wastewater services? Under what conditions, according to which factors? How do municipalities plan for or anticipate suburban and infrastructural development? Beyond or before (expected, habitual, LTS) infrastructure are ‘other’ existing socio-technical configurations adapted to situated suburban contexts of planning, finance, materiality and technicity (suburbanization), and ways of living/inhabiting these areas (suburbanisms).

To help with thinking through this case, and to begin to conceive of (the politics of) suburban socio-technical infrastructure configurations in new ways (or in ways which reflect situated suburban contexts), I will experiment with Easterling’s (2014) work on disposition in infrastructure space and her immanent reading of infrastructure spatial forms and their political implications. I track multipliers, topologies and stories as forms of disposition in infrastructure in suburban Stockholm.

Through this reading, the politics of (suburban) infrastructure is shown to be less about presence/absence and inequalities in absolute access to a stable configuration, than about the forms and outcomes of specific dispositions of infrastructure (and notably the sometimes quite local uneven distribution of costs and benefits of those dispositions). The Stockholm study shows that wider decisions about and planning of the future development of suburbs take place through infrastructure / socio-technical systems which “come out as fundamental stakes in conflicts around the organization and evolution of cities and societies” (Filion and Keil 2015, p.5).

Several municipalities in the Greater Stockholm periphery make clear distinctions in their planning strategies between areas already connected to a municipal or inter-municipal water and wastewater network, areas that are expected to be linked to such networks in the future and those that will permanently remain beyond municipal networks for various technical, geographic and economic reasons. These latter areas, where individual wells and septic systems predominate, constitute a sizeable proportion of the Stockholm archipelago. A total of 100,000 households in the region are not connected to official water or wastewater networks, or both. In Norrtälje, which is the largest municipality in terms of area, 45% of the population lives beyond the reach of centralized infrastructure networks. Infrastructure is also, crucially, closely linked to particular, evolving forms of suburbanism here as areas which were only previously inhabited during summer become areas of ‘permanent’ living with important implications for service provision, and as more and more people move in to these areas where homes and land are cheaper than in central parts of the Stockholm region. So the rationale of ‘total network coverage’ is far from the reality here. Several techniques, depending on the locality, are employed for the provision of water and sanitation services. In between a direct connection to a centralized network at one end of the scale, and individual solutions such as wells and septic tanks at the other, are several options that are utilized for small groups of dwellings, which are often located some distance from urban centres. Either the dwellings cluster together to connect to a centralized network, or they implement collective autonomous solutions, such as a small treatment plant for example, which are used only by the local residents. This hierarchy of technical solutions according to several local factors (density, distance from network, geographical conditions, costs, etc.) therefore allows the adaptation of services to vary to some extent, depending on specific contexts and living conditions. This approach to infrastructure, which operates on the principle that a number of sparsely populated areas will never be supplied by centralized network systems, opposes the largely dominant view that network expansion tends to follow, accompany or even anticipate the urbanization of new suburban areas.

As an increasing proportion of urban development is suburban, then a focus on evolving suburban infrastructures casts light on how a traditional urban paradigm of centralized infrastructure deployment, growth and extension is shifting, and thus how the suburbs are also a site of socio-technical and sociopolitical change beyond a ‘networked city’ frame of thinking and planning practice. At the same time, local suburban infrastructure planning also serves a broader regional purpose in equipping zones where further population growth is taking place and is expected, and thus sheds light on the politics of urban regional development and its resource distributions. Decisions and configurations are ripe with tension and conflict as they reshuffle existing arrangements for particular interests and contested purposes. There is thus a material politics to suburban infrastructure which is excessive of technical systems and works through specific forms of disposition made visible in the relations between infrastructure components.

Schramm, Sophie and Wright Contreras, Lucia

Suburban constellations of water supply and sanitation in Hanoi—*Abstract*

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*Doi moi*, Vietnam’s transition from a socialist state towards a socialist-oriented market economy roughly 30 years ago has triggered massive urban growth in the country, where national urbanization rates were 33% in 2014 (UN, 2014) and are now projected to reach 58.8% by 2049 (GSO, 2011: 27). Particularly Hanoi, the capital of the Socialist Republic of Vietnam, has been facing massive urban growth since the beginning of the 1990s, as relaxed influx controls and new economic opportunities have motivated people to migrate from territories formerly designated as rural to the city (Quang and Kammeier, 2002; Han and Vu 2008). The government has reacted to this influx with a step-by-step expansion of the city’s administrative area through the creation of new urban districts. Furthermore, in “growth coalitions” with real estate developers, the city government of Hanoi has promoted the development of so called “new urban areas”, housing estates on former farming land (Labbé and Boudreau, 2011). These new urban areas shape the suburban landscape of Hanoi together with peri-urban villages, which have expanded rapidly since *doi moi* and partly integrated into the urban fabric. In short, “*In physical terms, a new type of urbanism has emerged at the edge of the city, with a great diversity of intermixed landscapes, including walled residential estates, ad hoc densification of pre-existing villages, and the tight intermingling of small-scale industries with commercial, residential and agricultural activities.”* (Leaf, 2002: 29). Thus, it is particularly the suburban landscape of Hanoi, which reflects the increased social stratification in Vietnam since the introduction of a market economy in the 1990s (Labbé and Musil, 2011).

These suburban socio-spatial constellations are particularly apparent in urban systems of water and sanitation. While investments in the expansion of water supply and - to a lesser extent - sanitation networks result in relatively high connection rates of citizens to central networks, the public utilities for water supply and sanitation respectively have hardly undergone institutional changes. Despite the political goals of economic liberalization and recovery of costs in infrastructure service provision along with the transition to market socialism, urban water and sanitation policies still reflect the modern ideal of service provision through large infrastructure networks at low costs to urban dwellers. Due to outdated institutional structures and policies as well as low cost recovery from tariffs, the capacities of both utilities are severely restricted. This contributes to a diversification of service provision in suburban areas. Firstly, new actors emerge, who provide services exclusively within new urban areas, thus creating spatially restricted “satellite network systems”, often ignoring and at times disturbing surrounding topologies of water and sanitation provision. Secondly, in peri-urban villages, a hybrid mix of self-organized and community-based forms of service provision from wells or through septic tanks, or local water and sanitation networks emerges (Schramm, 2014). Thus, suburban areas of Hanoi are subject to drastic socio-spatial diversifications and decoupling of service provision.

We analyse these trends starting from the stance of urban infrastructure studies, according to which flows of (waste) water are closely intertwined with urbanization patterns and reveal broader dynamics of urban resource distribution and access (Graham and Marvin, 2001; Kooy and Bakker, 2008). Thus, Hanoi’s “splintered” landscapes of water and sanitation provision, consisting of centralized piped- water and sanitation schemes, privately-owned wells, decentralized septic tanks, and other technologies, are a crucial lens to explain the fragmented urbanization of Hanoi reflecting Vietnam’s social stratification since *doi moi*. We study the ecology of potable water sourcing and distribution, wastewater collection and disposal, and its relations with social and political constellations that direct the management and investment in water and sanitation systems. Thus, by comparing new urban areas and peri-urban villages, we reveal the contradictions between formal policies, which follow the modern ideal of unitary network provision and actual patterns of service provision shaped by broader suburbanization dynamics.

We focus our analysis on suburban areas, as we hypothesize, that a) their particular infrastructure constellations reveal contested power relations between different stakeholders and structural changes in global urbanization processes and that b) due to their rapid transformations and the relative weakness of path-dependent centralized infrastructure systems, they have the potential to host innovations and alternative infrastructural solutions (cf. Monstadt and Schramm 2013). We conclude by considering potentials for a more equitable distribution of resources and services in Hanoi through a broader spectrum of water provision and sanitation solutions. This research urges urban planners and local governments to revise the direction of future planning visions.

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**Simone, AbdouMaliq, Max Planck Institute**

Relays—reworking trajectories of articulation among peripheries and cores

AbdouMaliq Simone, Research Professor, Max Planck Institute for Ethnic and Religious Diversity

I am not a man of the suburbs, per se. Almost all of my work across past decades has taken place in urban cores, although the distinction between core and suburb is something that in Africa and Asia oscillates, and sometimes even inverts. In this presentation on Greater Jakarta, I want to emphasize the shifting interfaces as a locus for various relays undertaken by residents that are forced, and sometimes choose, to maintain a position in very different urban settings.

Desires for security and ownership of property, widely believed to be a critical guarantee of security, prompt large numbers of residents in Jakarta to acquire it at the peripheries of cities. Vast tracks of cheaply built, largely single story dormitory-like small houses are constructed with initially “shiny surfaces” and offered at low prices. These are being taken up en mass particularly by a young generation of aspirant middle class couples and households whose incomes can no longer match the escalating prices of rents and property values in the urban cores and near-suburbs or where households wish to retain a larger proportion of income for non-housing expenditure or saving. Often these tracts are the legally mandated provisions of affordable housing which accompany more upscale and lucrative developments of gated communities and new towns. Whatever the scenario, developers of cheap housing at urban edges frequently cut and run after attaining a particular percentage of sales, leaving households holding bank mortgages in developments whose infrastructure and services rapidly fall apart.

Municipalities responsible for the territory attempt to make as little investment as possible. At great distances from work and ill served by public transportation, households are relegated to protracted periods of waiting. For not only have their acquisitions been premised on attaining affordable housing but by the conviction that their decisions to locate themselves far from the urban core would eventually, in the not-distant future, be rewarded by the city catching up to them and the concomitant appreciation of land value that process would entail.

Indeed, the filling-in of the interstices often does take place, rarely as fast as residents had calculated, but in the interim the waiting has produced corroding built environments, which fast lost their gleam and instead become slums. While solidarities among residents are often cultivated in face of the absconding of developers and indifferent municipalities, there often is just simply too little in terms of resources and time to work with in order to build the heterogeneous built environments and social economies that often characterized previous and similar minimal outlays of housing and infrastructure in other parts of the city.

In locational decisions largely premised on the anticipation that residents would find themselves eventually embedded in a rapidly urbanizing context that through which diverse articulations with the surrounds could be built, periods of protracted waiting usually entail a hesitation on the part of residents to make any major moves—in terms of upgrading, economic investment or the cultivation of social institutions. While the initial constructions are often so minimal as to require self-constructed extensions in order to make any kind of residence viable, most of these tracts will display little further adaptation or development. Many of these residents grew up in dynamic working and middle class urban core districts, which may have been proximate to slum areas, but never resided in slum conditions per se. The rapid deterioration of the built environment, often accompanied by drastic impingements of nature, reproduce the very conditions which most residents sought guarantees to avoid.

At the same time, those that wait often say that they are actually in the “central city” that has yet to catch up to them. And as this purported center has been cheaply built, often quickly collapses or returns to the bush, residents, nevertheless, continue to experience themselves at the “urban core”. What is interesting about the joke is that they don’t see their locational decisions as anticipatory of something at which they will be at the center of, but rather that their locational decisions set up the prospect of exposing them to the intensified force of the snowballing interactions of deals, spatial products, conflicts, aspirations, infrastructures and economies headed “their way”, and thus will radically change them as persons.

Regardless how much this might be interpreted as speculation, investment, affordability—these are indeed all at work—the “sense” is one of detaching themselves from already sedentary positions in the “actual” urban core to reposition themselves in the line of urbanity’s “full force”, even though they cannot point to exactly what that force of the urban is, or break it down into specific parts. But what if it doesn’t come; what if people realize they have made the wrong decision, where their investments quickly deteriorate in front of them? Many will try to regain a foothold in back in the urban core that they vacated. Stuck with long-term payments and limited opportunities for resale, how do residents maneuver their way across wider circuits of engagement and opportunity.

In some instances, the low-end developments, far from commerce and social amenities, cultivate strong lateral support ties among residents and intensify the exchange and pooling of information about what is taking place in the larger region. Importantly, the demand for cheap accommodation close to the center—including the need to circumvent gridlocked Jakarta thoroughfares—and the need for residents of the urban core to generate supplementary value to cover escalating property taxation combines to produce a large volume of short-term accommodation through which many residents, ensconced or raised in the peripheries, now circulate. So there are the proliferation of relays between the urban core and near-suburbs and the more peripheral areas. This is a process that makes population counts and density levels in much of central Jakarta difficult to ascertain, as a more mobile population circumvents registration and contractual relationships. The decreasing periods of average residential stays also coincides with a tendency, particularly for youth, to circulate through many different jobs across Jakarta. The game is to be at the right place at the right time, yet it is difficult to anticipate what these temporalities and spaces might be in regions of quickly assembled and disassembled consolidations and dispersals.

**Vidal, Cecilia Alda, Kooy, Michelle and Rusca, Maria, UNESCO-IHE**

**Opening the black box: everyday operation of the urban water supply system in Lilongwe, Malawi**

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**Extended Abstract**

This paper illustrates the co-production of (sub)urban spaces and sub-standard water service provision in the city of Lilongwe, Malawi, in order to decenter conceptual understandings of (sub)urban infrastructures. Lilongwe's water supply infrastructure is characterized by a centralized network system which covers up to 78% of population in the urban area, but provides highly intermittent and irregular supply across urban space and between urban populations (Hadzovic Pihljak, 2014). The water company reports only an average of 18 hours of "continuous supply of potable water to over 60% of the customers in the distribution system" (LWB, 2012, p. 16) with less affluent suburban areas on the periphery of the city facing higher rates of supply intermittency or non-service than the affluent urban core.

The lack of reliability (in terms of continuity and pressure) of Lilongwe’s water supply has a marked infrastructural characteristic. There is sufficient available water at the source (Kamuzu I and II dams) but the storage and distribution systems in the city are not capable of providing enough water, especially during the dry season when demand of water grows. The gap between water production and system demand is calculated as at least 14.000,00 m3/day (ibid). The uneven quality of water services is currently “told from the safe place of engineering and technical knowledge” (Filion & Keil, 2015, p. 6), and rationalized as a technical problem: users located closer to the node of supply present better conditions than the one situated at the end of the infrastructure or in low-pressure zones (Lee & Schwab, 2005; Vairavamoorthy, Gorantiwar, & Pathirana, 2008). This ''rendering technical'' of the city's water supply helps to obscure the political elements that are located at the core of the design, operation and maintenance of infrastructure (Filion & Keil, 2015; McFarlane & Rutherford, 2008).

We seek to disrupt this narrative for Lilongwe and open up the ''black box'' of water infrastructure, documenting how political and technical elements interact to produce uneven distribution of water along the network system and across the city. We identify how the city's water infrastructure and its operation contributes to the delineation of segregated of urban spaces (i.e. urban core and suburban periphery) and the reinforcement of existing social inequalities between different inhabitants of the city.

We do this through an infrastructural ethnography, documenting the ways in which everyday decisions and practices of engineers, utility managers, and water users change flows of water throughout the city.

In a context characterized by technical uncertainty, continuous improvisation, and constant malfunctioning and disrepair, pumps, tanks, valves, and pipes are subjected to operational decision and manipulation on daily basis allowing specific users and areas of the city to evade supply discontinuity problems. Identifying where decisions are made, how, by whom, and why, we reveal the political elements that are located at the core of the operation and maintenance of the infrastructure. We find that the prioritization or neglect of specific users and locations is driven not only by the ability of different users to claim better services but also by the water utility employee’s understandings of how (society and) infrastructure should work and what (sub)urban spaces have more priority. We trace how characterizations of (sub)urban spaces determine the type of infrastructure and quality of the service provided by it and in turn the types of water infrastructures in urban spaces shapes their classification.The result is an informal standard operating procedure which exacerbates water access problems in high density, low income, (sub)urban areas.

Through this ethnography of everyday practices, we also reveal the contingency and flexibility of what are often seen (from a Northern perspective) as fixed, stable, buried infrastructures (Furlong, 2010, 2014). Our contribution to the workshop theme is therefore also conceptual. Specifically, we aim to destabilize three sets of binaries which impede our understanding of access to water infrastructure in the gobal South. First, we trouble the fixed distinction between urban and sub-urban, documenting how areas in the city boundaries can be "made" sub-urban via everyday practices of water supply engineers. Second, we seek to unsettle established binaries of connected/non-connected used to describe access to infrastructure, illustrating instead the high degree of differentiation in access within the networked system. Third, we upset the distinction between soft vs. hard infrastructure by documenting the ways in which seemingly fixed infrastructure systems are manipulated through everyday practices.

Our account of Lilongwe’s water network therefore challenges (northern) assumptions of infrastructure as universal, obdurate, stable, and black-boxed showing instead a highly malleable, dynamic and contested water infrastructure. It highlights the role of everyday decisions and practices (Anand, 2011, 2012; Hossain, 2011; Lawhon, Ernstson, & Silver, 2014) to break with the focus in infrastructure as the result of large scale decision making processes by high level actors. In the case of Lilongwe, decision making over the operation of infrastructure is not the exclusive realm of technical knowledge and experts, the water utility staff and users with different levels of power interact to manipulate (and negotiate the manipulation) of the technical elements of the network in different ways to achieve different supply scenarios.

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**Vojnovic, Igor, Eckert, Jeanette and Li, Xiaomeng, Michigan State University**

**Black Cities/White Suburbs:**

**Shaping Michigan urban and suburban landscapes of inequity and inequality**

**Igor Vojnovic, Jeanette Eckert and Xiaomeng Li**

The 1960 U.S. Census was a turning point in revealing new patterns in American city building. It triggered a debate on urban and suburban development processes that continues to be at the forefront of national policy discussions, and over the years it has taken on environmental, socio-economic and public health dimensions. Between 1950 and 1960, the U.S. urban population grew by almost 23 million people, an unprecedented increase in absolute numbers, as the country became over 63% urban (U.S. Census Bureau. 1993). In this one decade, the urban population in America had increased by 38%. As relevant of an issue as the urbanization was the recognition that while the urban population increased by 38%, urban land use increased twofold during the same period (Boyce, 1963). The average urban density in the U.S. decreased from 5,410 persons per square mile in 1950, to 3,759 persons per square miles in 1960. A new socio-demographic and structural pattern had emerged in the building of American urban centers, and along with it came a distinct imprint of spatial segregation that generated a new landscape of inequity and inequality, evident in part with the blackening of cities and the whitening of suburbs.

Into the latter-20th century, a new spatial structure was imprinted across urban regions, increasingly characterized by urban decentralization and dispersion. An increased use of land became evident in the production of built space, from the construction of roads and highways, to the development of commercial, retail and residential spaces. Between just the years 1970 and 2000, the average lot and house size doubled across the U.S., with lots averaging 14,000 square feet and houses averaging 2,400 square feet by the year 2000 (Burchell et al., 2002). Into the late-20th century, development also continued to increasingly decentralize and disperse. The results of these broader national development patterns, as revealed by the work of Robert Burchell and colleagues, were seen with ever-increasing rates of land consumption. Between 1982 and 1997, while the U.S. population grew by only 17%, urbanized land increased by 47% (Burchell et al., 2005). This was a development trend that was converting some 2.2 million acres of U.S. natural lands, forests, wetlands and farmlands into urbanized uses every single year.

By 1970, more than half of the population living in metropolitan areas lived in suburbs, and this population was predominantly white. By 2000, suburbanization became even more pronounced, as more than half of the total American population lived in suburbs, and again, this population was predominantly white (U.S. Census Bureau. 2000). It was generally the wealthier, whites fleeing central-cities in the post-World War II period, a process that became known as *white flight*. In addition, it was not just that the U.S. population was suburbanizing, but so was the urban tax base, with this decentralization generating a rapid decline of American central cities, particularly evident during the 1970s and 1980s.

In Michigan, the cities were at the forefront of national urban decentralization trends, and it was evident in not only the scale of suburbanization but also in the rapid disinvestment and decline of urban cores across the state. During the 1980s, the deteriorating state of Michigan cities captured national attention with Michael Moore’s film *Roger & Me*, which showed the crippling economic decline of the City of Flint. From 1970 to 2000, the rate of suburbanization across Michigan ensured that the development of land was increased ten times faster than population growth. As of 2000, more than 60% of the Michigan population lived in suburbs (Orfield and Luce, 2003).

Between 1982 and 1992, Michigan lost 10 acres of farmland every hour to urban development, a total of 854,000 acres of farmland over the course of the ten years (Burchell, 2005). And while many urban centers in the state can be used as examples of excessive suburbanization coupled with rapid central-city decline—including Saginaw, Flint, and Bay City—it is ongoing decentralization of the Detroit Region, along with the decline of large areas of the City of Detroit, which has captured national and international attention.

In the Detroit region, from 1960 to 1990, the land to population growth ratio was thirteen to one (Public Sector Consultants, 2001). The City of Detroit’s population, which had peaked at some 1.85 million people in 1950, had declined to a population of 713,777 people by 2010 (U.S. Census Bureau, 2011). By 2013, according to the U.S. Census Bureau, the city’s population estimate was 688,701 (U.S. Census Bureau, 2015). The steady population exodus out of the City of Detroit between the years 2000 and 2010 has averaged 63 people every day, or about 3 people every hour. In addition to the population decline, a clear racial and class imprint has emerged across the city and its suburbs. By 2010, 83% of the City of Detroit residents were black, while in the broader Metropolitan Detroit area—an area consisting of over 3.86 million people—over 97% of all whites living in Metro Detroit resided in the suburbs (U.S. Census Bureau, 2011).

By the 2010 Census, there was a new pattern of urban (re)development that had emerged across large parts of the U.S., with evidence of urban reinvestment, urban growth, as well as growing ethnic and racial diversity in many U.S. inner-cities. However, it is also apparent that, as in the case of Metropolitan Detroit, Midwestern cities continue to be vulnerable to development processes characterized by extreme urban dispersion, combined with urban disinvestment and decline (Short and Mussman, 2014; U.S. Census Bureau. 2011). Within the context of these ongoing trends in the Midwest, this chapter will explore city building processes—including service provision and infrastructure investment—and the shaping of the built environment across Michigan urban centers, including the Detroit region. Dimensions of class, race and local culture are explored in (re)development processes as are the resulting impacts of socioeconomic and racial variables on access to urban amenities across Detroit region neighborhoods. The chapter reveals that traditional relationships between urban form and accessibility in the city are not necessarily replicable in highly segregated, underclass neighborhoods experiencing intense disinvestment. These urban neighborhoods in decline have been increasingly developing characteristics of extreme low density suburbs in accessing urban amenities despite their built environments, which are characterized by higher urban densities, mixed land uses and connected street networks.

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**Wachsmuth, David, University of British Columbia**

**The “In-Between Territories” of Suburban Infrastructure Politics**

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There is a contradiction in the contemporary relationship between infrastructure development and local growth politics in the United States. On the one hand, infrastructure development is commonly understood to be a central policy focus of growth coalitions, since infrastructure provides the material preconditions for new capital investment in localities. The emergence in recent decades of new infrastructure-led development strategies based around trade and logistics has strengthened this focus and supplied new tangible targets for growth politics. But, on the other hand, infrastructure development also challenges the coherence of local growth coalitions, since infrastructure projects frequently exceed the local and metropolitan scales at which such coalitions are preferentially organized (via municipal governments, chambers of commerce, economic development corporations, and regional partnerships).

In this paper I argue that this contradiction has been driving a new form of multi-city growth politics in the US—one which has tended to privilege certain specific suburban development interests. The paper advances two major claims. The first is that “geographical market making”—the extension of effective supply chains and the intensification of circulatory possibilities within a supply chain—offers a structuring principle for new, emerging multi-city growth coalitions analogous to the role of land use intensification underlying traditional local growth machines. The second is that “in-between territories”—suburban jurisdictions located between major growth poles along urban corridors—have become key strategic points in the territorial politics of geographical market making and infrastructure politics more broadly.

The first section of the paper discusses the relationship between the development of the built environment and the local growth coalitions widely understood to be central to contemporary entrepreneurial urban governance. On the basis of that discussion, I introduce the concept of geographical market making, and outline the basic strategic contours of the multi-city growth coalitions which assemble to pursue geographical market making strategies.

I then proceed to argue that geographical market making generates a distinctive suburbanized spatial politics. Where local economic development agendas in polycentric urban regions are driven by infrastructure priorities of the growth poles, specific suburban spaces can emerge as strategically important sites for territorial growth politics. This is thanks to 1) the imperative to unite political-economic interests across the entire regions, and 2) strategic opportunities for siting new infrastructure development along established corridors but outside the major growth poles. I call these sites “in-between territories”, in the sense that their strategic significance arises from their spatial location in between growth poles along urban corridors. But describing these sites in terms of their relationship to nearby major cities is not meant to imply that they are peripheral. Indeed, while in-between territories are *spatially* “in-between”, they are *strategically* central.

In the paper I develop this argument through a comparison of suburban infrastructure politics in two sites in the United States: Pinal County, Arizona and Polk County, Florida. Pinal County is a rapidly urbanizing county between the major Arizona growth poles of Phoenix and Tucson. In

the last 25 years its population has increased four-fold, from 100,000 residents in 1990 to over

400,000 by the end of 2014. Much of that growth has been exurbanization from greater Phoenix along the main interstate corridor of I-10. Polk County lies along the I-4 corridor in Central Florida, equidistant between Tampa and Orlando. Like Pinal County in Arizona, Polk County has been one of the fastest growing areas of the state thanks to expansion from the two major cities it lies between, although it has grown from a larger base, with the city of Lakeland accounting for

100,000 of the more than 600,000 residents in the county. In the last ten years both the Phoenix- Tucson and Tampa-Orlando corridors have been the sites of new economic development strategies focused on expanding and intensifying the built environment for trade and logistics. And in both cases, the in-between territories of Pinal County and Polk County respectively have become (surprisingly? disproportionately?) central to these strategies.

Since 2010, in the wake of the onset of the Great Recession and the complete collapse of Arizona’s housing-led growth pathways, a group of metropolitan planning organizations in Phoenix-Tucson corridor has been collaborating (as the Joint Planning Advisory Council) to develop a new freight-led economic development strategy. The centrepiece of the strategy is an attempt to create a distributed “inland port” to capture logistics activity from the Los Angeles and Long Beach ports, and from Mexican maquiladoras. And Pinal County has become the linchpin in this strategy—the “cream filling in the Oreo cookie”, as one of my informants described it—because it has readily developable land located between Phoenix and Tucson and with good connections to two interstate highways and the Union Pacific rail line. In Central Florida, Polk County has played a similar role in corridor-wide planning and development

schemes. The distributed nature of Florida’s ports (unlike most coastal states, there is not a single large primate port but rather a range of medium-size facilities) means that the centrally-located Polk County has been an attractive destination for new logistics initiatives.

The paper systematically compares these two cases, and draws out the implications for the future of urban growth politics in an increasingly polycentric and suburbanized urban landscape.

**Walks, Alan, University of Toronto**

**The Suburban Debtscape: Automobility and Financial (Infra)Structures**

Dr. Alan Walks, University of Toronto

The “Long Twentieth Century” (Arrighi 1994), a concept that continues from the late 1800s to the present, has been witness to the most rapid urbanization of the globe in human history. From only 1.6 billion people in 1901, only 13 percent of whom lived in cities at the time (roughly 220 million people), the world population has grown to over 7 billion, with more than half (3.6 billion people) living in cities by 2011 (UN 2012, 2013). While urbanization has been rampant over this entire period, in absolute terms it is the post-war period that has seen the most rapid rise in population. By 2011, the global urban population – the proportion living in cities – was 43 percent larger than the entire global population in 1950 (Ibid.). Furthermore, the quality of such urbanization has changed since the end of the Second World War, with the automobile – and automobility – becoming the primary means of mobility in many nations and cities. Motor vehicle travel totaled 2.8 trillion passenger-km in 1950. Just 50 years later, this came to 32 trillion, a more than 1,000 percent increase (Walks 2015a). It could be argued that the Long Twentieth Century has been the “Century of Automobility” (Walks 2015a; Volit 1996).

While there is a diversity of suburban forms and “suburbanisms” (Walks 2013a), the kind of urbanization that has been most common in the post-war period, typically but not exclusively automobile-oriented, has required disproportionate levels of infrastructure dedicated to facilitating automobility, such as wide roads, parking lots and garages, highways, exit ramps, gas stations, and driveways, in addition to the vehicles themselves. All of this has had to be financed. The state – both the local state (municipalities), as well as upper levels of government (national and provincial/state levels) – has financed the bulk of the public infrastructure (streets, rights of way, public parking, highways), while the “private” sectors have covered the financing of such infrastructures on private lands (mall and office parking, gas stations, etc). The household sector is, however, the key consumer, whose purchasing of automobiles, and places to move and store them (driveways and garages, typically on residential lands) has helped “drive” the shift toward the auto-mobile city (or as Walks 2015a calls it, the “auto-city”).

Separate kinds of financial infra-structures have been set up for states and households to finance such expenditures. States have relied on bond markets for raising funds, as well as inter-governmental transfers or lending facilities of various kinds, leading to rising levels of debt. Similarly, households have relied on different kinds of financial structures to borrow for the purchase of automobiles, residential property, and other expenditures. Since the 1990s, the adoption of loan securitization – the packing of mortgages into mortgage-backed securities, and automobile loans into asset-based securities, among other things – has worked to provide households with greater access to credit for such purchases (see Walks 2014; Walks and Clifford, *forthcoming*). In many nations, including Canada, both municipal levels of debt, and household debt, has thus increased over time, with the most rapid increase taking place since the year 2000. The contours of this landscape of indebtedness, and the forms its rise has taken since this time, constitutes an important aspect of what I call the “urban debtscape” (Walks 2013b). The latter involves not only the levels and forms of indebtedness, but also credit cultures, financial structures, and the politics of debt, in different places.

Given the large proportion of contemporary populations living in the post-war suburbs, the suburban debtscape is an important component of the overall global urban debtscape. While, again, there is a huge diversity of different kinds of suburbs and suburbanisms (Walks 2013a), a greater proportion of total outstanding debt, among both households and municipalities, in the post-war suburbs of metropolitan areas in developed nations such as Canada is related to the purchase of vehicles and the infrastructures put in place to support automobility. This means that the suburban debtscape features some different characteristics, different processes, different outcomes, and potentially different futures, than is found in other kinds of communities. One of the aims of this paper and presentation is to understand these characteristics, and examine the processes producing alternative scenarios for municipalities and households in the suburbs developed since the Second World War. The data empirically examined for this paper derives from Canadian cities over the period 2000 through 2012, and involves comparison of household and municipal debt levels, and levels of household bankruptcy, at different scales of analysis, from neighbourhoods, to municipalities, to metropolitan areas. A series of indices of financial vulnerability are constructed and examined for municipalities and households at these different scales, including interrogation of their socio-demographic, financial, and structural correlates.

Patterns of indebtedness and financial vulnerability vary considerably among suburban places. Furthermore, higher expenditures on automobiles and automobile-oriented infrastructure are not found to necessarily impart higher levels of financial vulnerability or indebtedness. Indeed, in some places, these variables are a source of economic and financial strength (as they are for many automobile-dependent metropolitan areas, see Walks 2015b). However, there are factors that structurally weaken the future financial viability of certain automobile-dependent suburbs and the ability of households to amass wealth through homeowership equity, raising the level of risk to future financial adjustments in such places. These factors are discussed, and their implications for the future of the suburbs examined.

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**Woudsma, Clarence, University of Waterloo**

**Suburbanization, Suburbanisms and Freight; Infrastructures at the Crossroads**

Clarence G. Woudsma, University of Waterloo

Freight, goods, commodities, products; are descriptors of the physical materials that flow in the city and the suburb, sustaining urban vitality. Suburbanization and suburbanisms include the consumption, production, and distrubution behaviours of residents and firms whose material related activity impacts, and are impacted by infrastructures on which it relies and which are indeed of central importance to the functioning of the entire urban region (Keil and Young, 2008). Freight activity also plays an important role in the configuration of cities and is shaped by places, as it also shapes places (Hall and Hesse, 2012). Arguably, the enabling infrastructures central to this paper are as much about “freight” as they are about “people” and the explorations of our central questions are from a freight perspective.

It is fascinating time to explore freight in this context. The dynamics at play include, (from Dablanc and Rodrigue, 2014)

* rising demands for express transport and courier activity related to the service economy,
* the dispersion of manufacturing and global supply chains that increase demands on local accommodation for frequent, timely delivery,
* the rise of mega distribution centres, often in suburban locations that serve the city, region and nation, (Cidell, 2012)
* and a retail landscape undergoing significant transformation under e-retailing and the rise of home deliveries.

This all points to increasing prominence of freight in the urban realm and it also raises important questions. Amazon offers one-hour delivery service in select markets but these are not suburban markets; is this a question of equity in delivery services considering the role of subsidized road infrastructure? How do the suburban infrastructures facilitate the urban core lifestyle that demands this level of service? What are the implications of the urban infrastructure served by a regulation mandated small, low emission vehicle while the suburban infrastructure crumbles under the weight, disruption, and noise of heavy trucks? Is the modern distribution/fulfillment center served by multi-modal (road, rail, air) suburban infrastructures the new shopping mall of the 1970s, undermining traditional (big box) retailing as the goods come to the people through home delivery? How are the negative “explosive” impacts of this activity or the integrative benefits felt throughout the urban region? The “last mile” (supply chain terminology for goods reaching their final point of consumption) of home delivery is spatially exhaustive - every point in the built environment is part of the material flow space. What does this fact mean for the exploration of suburbanization infrastructures?

These illustrative questions allude to the “crossroads” facing freight infrastructures: fundamental decisions need to be made with uncertain outcomes: connecting to the themes of exploration in this paper:

1. the diversity of freight related actors, agencies and interests involved in the “Upstream”, infrastructure-related decision-making
2. the neglected nature of the freight dimensions in the technical, political and critical discourses around infrastructures
3. the complexity of the downstream impacts of freight activity on broader society

The use of selective case study examples drawn from Canadian cities (including Vancouver and Toronto) will provide the basis for tackling a number of suggested questions:

* How do political and technological factors contribute to the evolution of infrastructure networks?
* Is there anything special about “suburban” infrastructures as opposed to generally “urban” infrastructures?
* To what degree do suburban infrastructures have a particularly important place in the extended urbanization we experience today?
* Is there a state, market and private authoritarian splintering of infrastructures going on in suburbia?
* What lessons can we draw from suburban infrastructure case studies about inequities built-in the decision-making and societal repercussions of infrastructures?
* What does the present suburban infrastructure reality tell us about possible future trajectories of infrastructures and suburbs?

Case studies include: (but are not limited to)

* Infrastructure developments in Greater Vancouver related to the Asia Pacific Gateway and Corridor Program
* Centre Port Winnipeg
* Metrolinx Urban Goods Movement Study
* Southern Ontario Gateway Council
* Peel Region Strategic Goods Movement Plan
* CN Intermodal Milton Proposal
* Canadian Tire Distribution Center, Bolton
* GTA West Corridor

The scale of interest from government actors in freight has aligned with their spheres of influence; Federal government – global/national; Provincial – national/regional or intercity; and Municipal – mixed but predominantly local. The local scale is where the complexities of freight movement play out with disconnects between the distant multinational actors driving supply chains of material flows and the local government/citizens that regulate and restrict freight movement rather than accommodate and understand these flows. The local response is to the negative externalities generated by the freight flows they coexist with, often not valuing the broader economic impacts of that activity, in large part driven by their own consumptive behavior. As phrased in a Transport Canada report – “people want the goods, but not the bads” The activity of the academic experts in infrastructure related to freight has squeezed out the suburbs with an earlier focus on larger regional, national global scale –during the rise of suburbia – replaced by recent surging interest in “city logistics” .

The short version of transportation infrastructures interest and research activity in the typical North American suburb is auto focused, transit challenged, active transport (walking, cycling) limited and freight forgotten. The literature on goods movement in an urban context has always been the in the shadow of the emphasis on people movement, with previous reviews pointing to deficiencies in understanding by planners, in disparate jurisdictions across the globe (Woudsma, 2001; Dablanc, 2007; Hall and Hesse 2012, Cui et al., 2015). The outcome of this paper will offer a small step towards shining light on the crossroads currently facing freight and the infrastructure it shares on the urban stage

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